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FOR QUARTER CENTURY THE BRICKBUILDER

A SPECIAL ISSUE

DEVOTED TO

PLANNING, BUILDING AND FINANCING

WORKINGMEN'S HOUSES

AND

INDUSTRIAL COMMUNITIES

IN AMERICA

APRIL 1918

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THE ARCHITECTURAL FORUM

VOLUME XXVIII NUMBER 4

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GROUP OF COTTAGES

THE STAFF CLUB

COTTAGES AT GRETNA — A BRITISH MUNITIONS TOWN IN SCOTLAND

THE ARCHITECTURAL FORUM
FOR QUARTER CENTURY THE BRICKBUILDER
VOLUME XXVIII APRIL 1918 NUMBER 4

War-Time Housing—A Supreme Opportunity

By ANDREW WRIGHT CRAWFORD

A YEAR ago, before we entered the war, the idea of Federal aid in building homes for workmen was unformulated; the idea of Federal construction of homes was undreamt. Yet now $50,000,000 has been appropriated for this purpose, and the legislative ship carrying $50,000,000 more is on the ways, almost completed.

A tremendous advance in one year, this: a greater is now possible.

In the National Housing Association a few years ago there was hesitancy over putting on the program the subject of state or municipal financial aid for housing. Toronto had tried it, the city lending its credit to the extent of 80 per cent of the necessary funds, the chief advantage being the borrowing of money at a much lower rate than otherwise would have been the case. Massachusetts had acted as pioneer in the United States by enabling its Homestead Commission, a state department, to erect houses. Elsewhere state aid was unknown in this country. In less than twelve months the public, the Administration, and the Congress have been educated to the new idea and have acted on it. It is a remarkable product of America's entrance into the war.

It is undoubtedly because of official and legislative recognition of the intimate relation, of the interdependence, between good housing and getting things done, that this forward step has been taken. The labor turnover witnessed everywhere during the past year has been one lever of unusual power in routing up old ideas of what the Government should do. That turnover reached 300 per cent in more than one industry doing war work. Discontented workers mean less production; it does not need statistics to show that contented, healthy workers produce greater results than discontented, unhealthy ones do. It is common sense that physically weak workers cannot produce the physical results that physically strong ones do. Ask yourself how you have felt after sleeping in a room with three or four others: realize that your doped feeling is but the counterpart of the same doped feeling felt by every workman who sleeps under similar conditions.

We expect supreme efficiency in our soldiers, and we hope for something approaching supreme efficiency in our war workers. Neither the soldier nor the workman who has slept in an overcrowded barracks can reach that height any more than you yourself can.

Lack of recognition of these facts, on the part of both public authorities and of manufacturers, has existed for many years. The initiative toward bringing them to public attention had already been taken, and in the National Housing Association and American City Planning Institute means of educating public opinion and expressing it had been created. It is only articulate public opinion that counts in such matters; the silent vote may count at elections, but housing matters have not yet constituted an issue before the electorate.

In addition to common sense we now have figures demonstrating the effect on physique of slum areas as compared with garden suburb areas to a rather remarkable extent. The following figures are taken from a book on city planning by George Cadbury, Jr., son of the founder of Bournville, one of England's most successful garden suburbs. The figures show the effect on boys and girls, in weight and height, of the conditions in the garden town of Bournville as compared with St. Bartholomew's Ward in Birmingham, only twenty minutes away.

Weight	Age 6 Years Pounds	Age 8 Years Pounds	Age 10 Years Pounds	Age 12 Years Pounds
Boys, Bournville	45.0	52.9	61.6	71.8
Boys, St. Bartholomew's Ward	39.0	47.8	56.1	63.2
Girls, Bournville	43.5	50.3	62.1	74.7
Girls, St. Bartholomew's Ward	39.4	45.6	53.9	65.7
Height	Inches	Inches	Inches	Inches
Boys, Bournville	44.1	48.3	51.9	54.8
Boys, St. Bartholomew's Ward	41.9	46.2	49.6	52.3
Girls, Bournville	44.2	48.6	52.1	56.0
Girls, St. Bartholomew's Ward	41.7	44.8	48.1	53.1

Obviously, the taller and heavier boys and girls, carrying the same advantages into their final stature, will work more efficiently than their stunted neighbors of the slum.

The Rev. Mr. Watt, chaplain of the Gordon Highlanders and the Black Watch, said recently, when speaking of one unhappy man: "He had a slum in his mind because he had a slum as his home." John Burns, the labor leader, formerly a member of the

English Cabinet and the man who secured the passage by Parliament of the English Housing and Town Planning Act of 1909, expressed the same thought when he said, "Mean streets make mean people."

The slum affects not only mental and physical stature, but life as well. Mr. Cadbury further gives the following figures, showing the effect on both the infantile and adult death rates of good or bad city conditions:

	Infantile Death Rate per 1000 Births	Ordinary Death Rate per 1000 Births
Bournville	55.0	4.8
Letchworth	50.6	6.1
Hampstead	62.0	9.8
Bournemouth	70.0	9.9
Lewisham	62.0	10.4
Hammersmith	90.0	13.1
London	101.0	13.6

It is to be noted that slums disastrously affect the future of the race. If her infant child is lost, the mother may be affected in her physique as well as in her spirits, and later children may be affected also. Some one has said: "Since individuals pass away, parenthood is the supreme factor in the destiny of nations." Parenthood should be encouraged, not discouraged by the death of a small baby after the long months of suffering to bring it to life.

View of Barracks First Built at Gretna but Later Abandoned for Cottages of Permanent Construction

It was with figures such as these, with figures demonstrating the effect of better housing even in reducing crime, that the campaign for improvement was being waged with hopeful, perhaps signal, successes here and there, before we entered the war on April 6, 1917. Then began the more rapid education by bitter experience. It was necessary to house the workers. How should it be done? There was a lack of local capital, or rather not so much an actual lack as fear of future losses should buildings be erected at present high prices, which might be cut in half by the unexpected ending of the war twelve months or six months later, causing a heavy loss because of such capital charges already incurred. This caused an actual decrease of building at the very time that there was an altogether unanticipated and unprepared for concentration of population at centers of war industries.

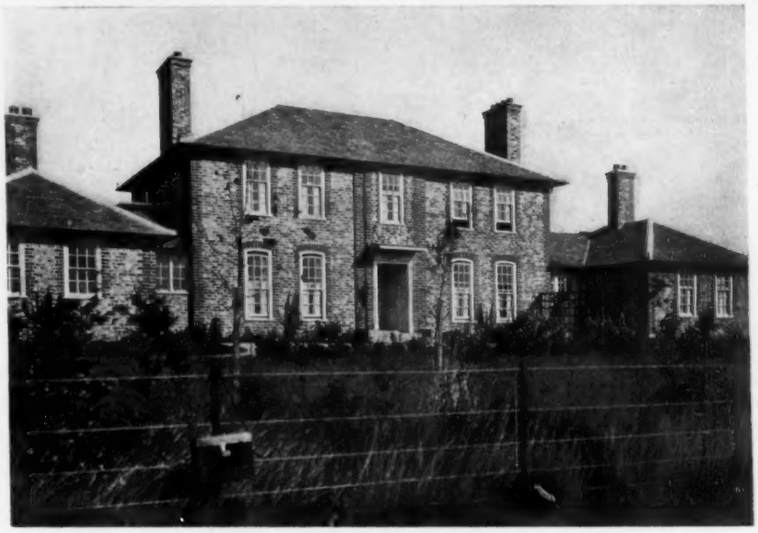
Philadelphia is, apparently, the greatest example of the combined resultant of these two forces. During 1915 and 1916 about the usual average of 8,000 two-story and three-story dwellings were built. In 1917 the number dropped to 3,000. The usual growth in population of Philadelphia is about 40,000 per year. The actual growth in the last three years is about 200,000, the greater part of which occurred in the last year and the last half of last year; and the likelihood is that 1918 will witness a growth greater yet, especially in the metropolitan district of Philadelphia. In dealing with such centers we are quite literally dealing with a nation in size; for in metropolitan Philadelphia, which includes the city and the area within ten miles of its limits, disregarding all state or county lines, there is a population equal to that of the whole of Norway—a population greater than that of Ecuador and Nicaragua combined.

That the immensity of the problem may be further illustrated, it may be noted that the mere addition to the population of metropolitan Philadelphia during the two years 1917 and 1918 will be greater than the population of Columbus, Ohio. This means, of course, that the physical plant of the metropolitan city, its streets, its transportation system, its schools, its parks, its playgrounds, and especially its houses, must be expanded to accord with this increase.

Obviously city and suburban planning and city and suburban building on a huge scale must be undertaken to meet this actual condition that confronts Philadelphia; and the same necessity exists in other communities that have become centers of war-time activities.

And withal there is need for tremendous speed. The bending back of the Italian line, the pressure on the French line, the collapse of the Eastern line, urges speed, speed, speed. And yet the two sides in the world-wide conflict are far more evenly matched than they were when the war broke out in 1914. With Germany forty years ahead of her in preparation, with the actual battle only thirty miles across the channel, with her very existence at stake, England coolly took the time to build for her munitions workers the best garden suburb yet created—the town of Well Hall; Scotland, urged on to haste, built a row of barracks at Gretna, and promptly abandoned their further erection and instead has built a garden suburb for 15,000 workmen. Will America, coming into the war with the opposing forces in men, in munitions, in finances, far more equal than

they were in 1914, when, indeed, matching resources against resources, — and modern warfare is well epitomized in the saying, "Soldiers win battles, wealth wins wars," — the preponderating advantage is decidedly on our side, will America, with the battle line five days away instead of five hours, fail to do as well for her workmen as Great Britain has done for hers? This is the question that the next twelve months will answer.



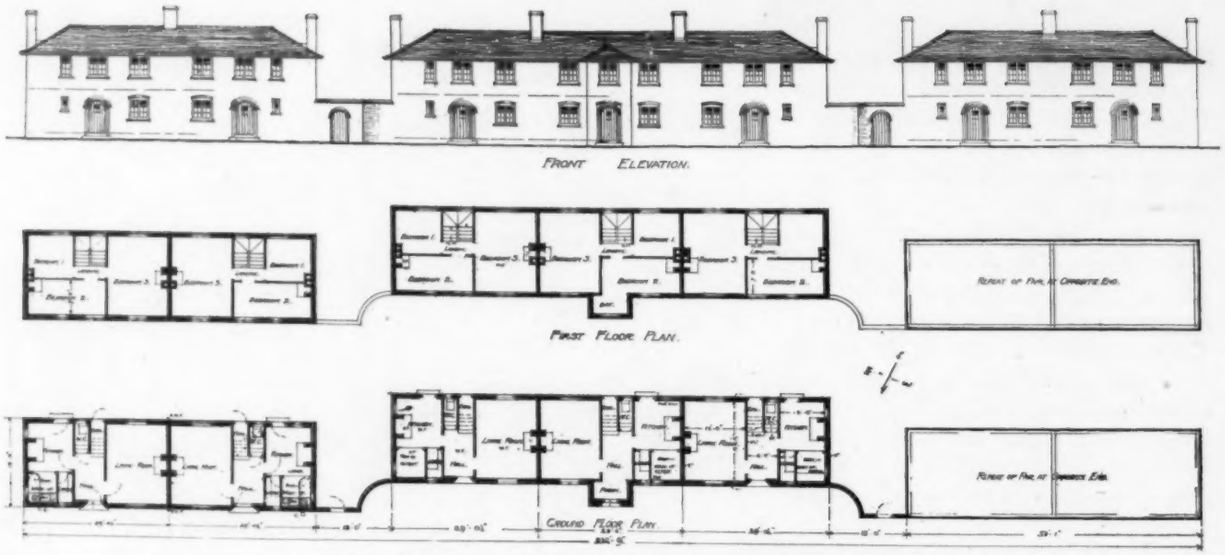
Staff Cottages at Gretna

At first President Wilson, like any other man new to the undertaking would have done, said to build barracks; but he has quickly swung away from that and now favors permanent buildings. Temporary means are unwise, if this war is to last more than six months. It is folly to prepare for less than six years. America can carry on the war for twenty-five years, and the sooner the Huns learn that, the better. Temporary barracks become a permanent slum. Their cost in the long run, financially, is greater than the cost in the long run of the best of housing, because, if well located, there should be little or no loss from the latter; whereas from the former the loss is 100 per cent on the buildings alone. Workers do not like bunks; they do not provide for family life; and now that so much of the rough work has been done at new plants like Hog Island, a better class of workmen — men trained in all sorts of trades — are being called for. The day laborer is giving way rapidly to the skilled workman: the latter can pay for and can only be retained by adequate housing and adequate means of education and recreation for his family, as well as himself.

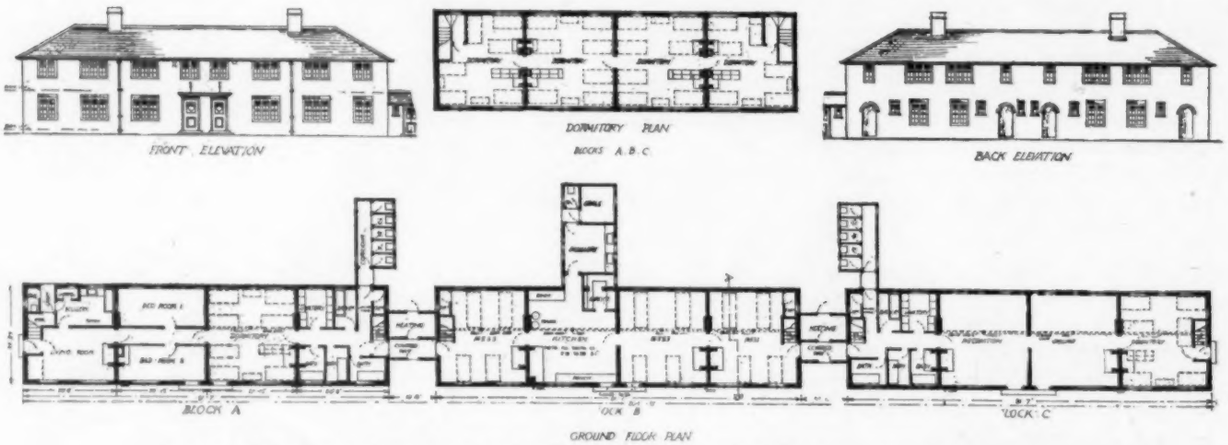
The immediate, critical problem is: What standard will the Government of the people and by the people set for the people in its first industrial town? On the answer to that question depends in large measure the standard of American housing for the rest of this century. A tremendous opportunity is at hand. The Government must take the responsibility of refusing the opportunity or of accepting it. Which will it be?

Will the Government accept what has been the standard heretofore, or will it accept the challenge of

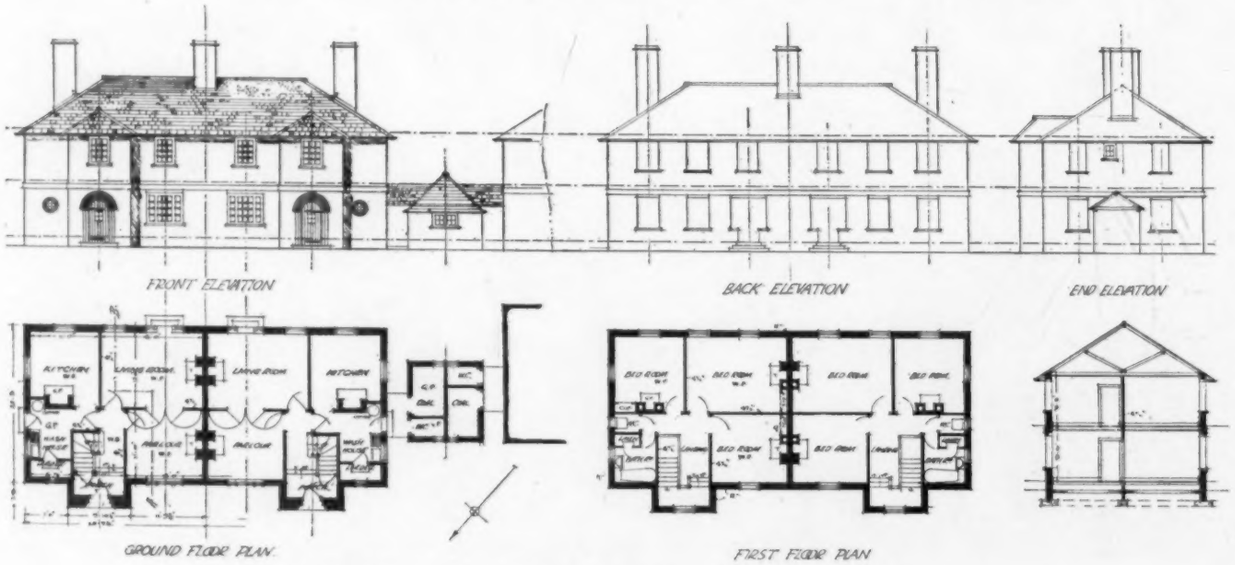
View Along One of the Streets of Gretna, the British Munitions Town in Scotland



PLANS AND ELEVATIONS OF FIVE-ROOM COTTAGES AT GRETNA



PLANS AND ELEVATIONS OF "COTTAGE SHELLS" TEMPORARILY USED AS HOSTELS

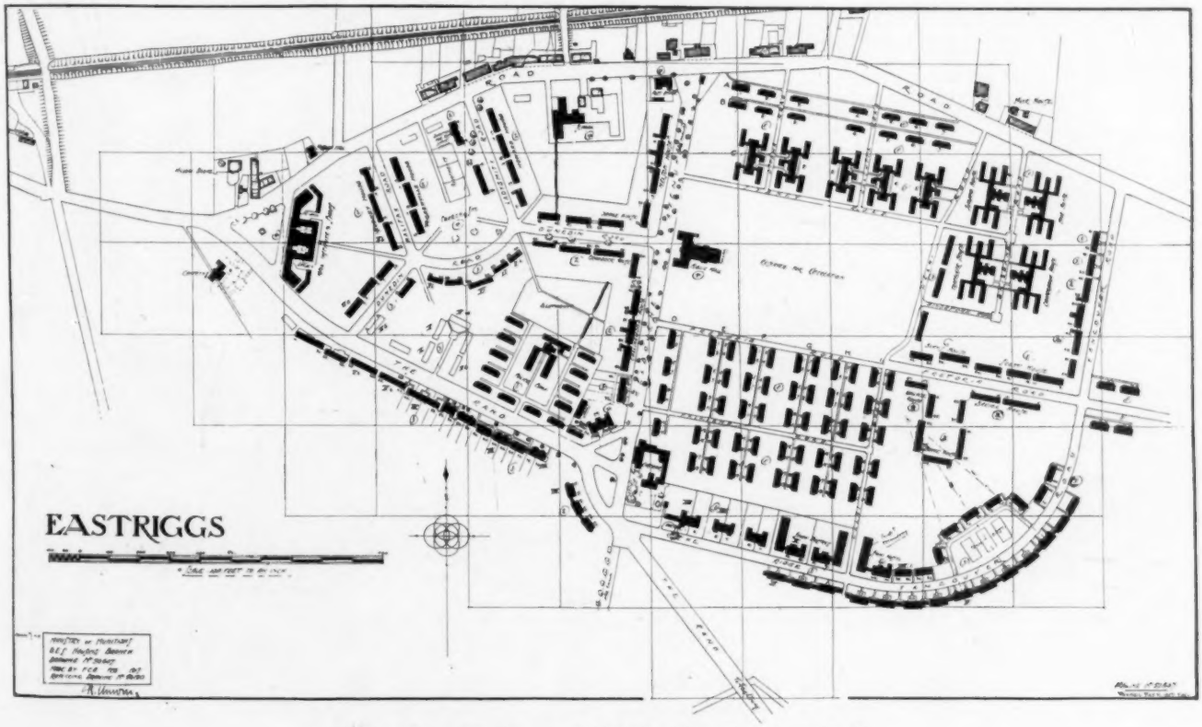


PLANS AND ELEVATIONS OF SIX-ROOM COTTAGES AT GRETNA

England and surpass Well Hall? Will it do pretty well or a little better than has been done by operative builders heretofore, or will it accept the challenge of Scotland and surpass Gretna? Will it seek housing conditions that will result in 75 or 80 per cent efficiency in its men, or will it follow the example of England and Scotland and aim at housing that will result in 100 per cent?

Recreation and Assembly Hall at Gretna

The method by which the first war town is built, the decision as to whether the houses shall be sold or rented only — I hope that in most locations they will be not only rented but sold, because every home owner is a better citizen than a mere residence renter — he has a stake then in the moral and physical surroundings of his home; if he doesn't own his residence, he can just move out like any other slacker — these questions, these policies, are not to-day the dominant ones for consideration. It is the physical town that the Government is to build that is the question now. It was not only the effect on health and lives, it was the effect on cheerfulness, the effect produced by the charm of the towns of Port Sunlight, Bournville, and Letchworth that enabled John Burns, the labor leader, to secure the adoption of the English Housing and Town Planning Act of 1909. If these towns had not been beautiful, if they had been as hygienic as sanitary science could make them, but ugly, that statute would never have been passed. The objects with which they were built, whether for profit sharing or philanthropy and 4 per cent, or as an example of community co-operation, were immaterial; it was the power of the attractiveness of the thing that was done in all these places that produced their counterparts in fifty-five other garden towns and suburbs of England, and that swept over old world opposition in Parliament, carrying the act of 1909 to victory. Whatever way the administrative side is handled, whatever way the ultimate destiny of each house is determined, are minor considerations now. The physical standard that the Government sets for the housing of the laborers of the United States is



Town Plan of Eastriggs, a British Munitions Town in England

the momentous consideration.

War-time housing differs from peace-time housing chiefly in the opportunity to do a finer thing in shorter time. But war brings with it a need for preparation, which the pressure of the war is apt to cause to be overlooked. We are learning by this very need of housing for our war workers how important it is in time of peace to prepare for war. The danger to democracy, the danger to America by the obliteration of space brought about by increased means of transoceanic transportation, of which the aeroplane is the latest example, will let us never again fancy ourselves safe from attack. Isolation is gone as completely as is the eighteenth century. But in time of war it is necessary to prepare for peace, and particularly to alleviate the suffering caused by the unemployment that will accompany it. The longer the war lasts, the greater will be the number of men who will come back from the trenches without occupation. The longer the war lasts, the greater will be the number of war-industry workers who will be thrown out of employment when those industries slow down or stop with the coming of peace. Every month sees more and more women employed in jobs formerly occupied by men. The women will not care to give up those jobs, nor will their employers want them to do so.

Street View in Well Hall

The period of reconstruction will be difficult. Now is the time to prepare for it, so that its hardships may be minimized. Always in periods of depression, public work has been stimulated in order to give employment to the unemployed.

Now, in war time, is the time to plan such work. Public work requires the preparation of city plans, their adoption, and the acquisition of the property on which the public work is to be done. These processes take time, frequently more than a year or eighteen months. Obviously if we wait until the end of the war to begin the preparation of plans, we will be too late to alleviate immediate suffering.

City planning in general is more urgent now than it has ever been and fortunately the war is making that fact evident. But the specific town plans and the definite housing adopted within the next few weeks by the Federal Government for its war workers is of supreme importance.

The Essential Principles of Industrial Village Development

By JOHN NOLEN

AS a result of unprecedented industrial expansion and the necessity to provide for military and naval forces, the subject of housing workingmen has risen to national, or even international, importance. This is partly the effect of the war and the consequent industrial expansion, and partly the expression of a somewhat new social and economic ideal. It is said now emphatically that the war cannot be successfully prosecuted without industrial, as well as military, strength and efficiency. It might appear to be an exaggeration to hold that the success of the American armies depends upon the number and character of workmen's houses in American cities. Yet many believe this is to be the case. And the United States Chamber of Commerce has stated that at the present time the proper housing of workmen *is the most necessary thing to be done to win the war*. This conclusion is a new and striking illustration of an old adage, "For want of a nail the shoe is lost; for want of a shoe the horse is lost; for want of a horse the rider is lost."

The other part of the movement is expressing itself in a genuine desire to improve the living conditions of all who labor, war or no war. The motive in part is unquestionably the welfare of the worker, but it is primarily based upon the conviction that without good living conditions, outside of factories as well as in, of which housing is and must always be the main feature, efficient labor cannot be secured and retained.

The problem of industrial housing in its broader phases may perhaps be best expressed by the term "community development." *It calls for the creation of a complete industrial town or village.* It cannot be solved by the mere building of houses, even though they be of good types. From the first step to the last, the solution of these problems requires special skill and experience. Furthermore, the problems of industrial housing are related to the still wider and more technical problems of city planning, city building, and the proper maintenance and administration of cities.

Essential Principles

Some of the essential principles of community development generally accepted as sound may be stated as follows:

1. The plan for the subdivision of the property should fit the topography and give due consideration to natural features.

2. Even if the land is relatively level, the plan should nevertheless have interest, good organization, and design. The point of view that leads to a good arrangement on hilly ground is also capable of securing a good arrangement on level land.

3. The use that is to be made of the land should determine its general plan and restrictions. There is no plan that is best for all places, nor for the same place for all time. Merit is largely a question of fitness for its original purpose, and its adaptability for probable future purposes.

4. Thoroughfares, and other broadly related city planning features, should be located first, and within these lines, and in conformity to them local streets and blocks and lots should be defined in the best possible manner.

5. The various standards for various classes of property, the lot widths and lot depths, the block widths and block depths, recognized by the best authorities, should be applied with skill and discrimination. These are by no means absolute or fixed; they are still open to discussion, and in each case are largely matters of nice judgment. Still, there is some law. For instance, the minimum requirements of detached, of semi-detached, and of row houses in which, for this purpose, there is substantial agreement, determine largely the width and depth of lots; the size of lots determines largely the size of blocks; the blocks determine the layout of the neighborhood. These, in turn, react upon street widths, playgrounds, and other public features.

6. An increase of lots or residence sites and of the necessary streets should be accompanied by a corresponding increase of playgrounds, parks, and other indispensable public features required by the probable population of the area when fully built up. The best time to make these reservations of public spaces is when the land is subdivided. The cost should be assessed in accordance with the benefit.

7. The interests of the real estate operator, of the prospective owner or user, and of the general public should be harmonized as far as possible. In most cases this is not so difficult as it might seem. While the immediate interests of the three parties are not identical, they are not in the long run normally in conflict. It is part of the responsibility of the public, acting through well considered and equitable regulation and law, to remove causes of conflict, and thus to define the rights and duties of the several parties.

8. A plan for community development must consider not only immediate use, but also probable subsequent use, administration, and maintenance; and must, so far as possible, forecast and provide for it. This may be done in part by the plan itself, and in part by binding restrictions and conditions, providing for permanency. Or it may anticipate a change or conversion into a different use. Opinions of designers differ as to which is more desirable,—a plan that makes change difficult or one that makes change

easy. Here again it is a mistake to dogmatize. One thing is clear, however, even from a superficial study of land subdivision in its relation to housing, namely, that the worst results have not been due usually to the low standard or the lack of fitness of the development for its original purpose, but to its lack of fitness for the purpose to which there was afterward an attempt to adapt it, or to the lack of public regulation, or the low standard which the city permitted to be applied.

Fundamental Questions

The fundamental questions which should be asked in the planning of an industrial town or village are the following:

1. What should determine the selection of a tract of land for an industrial village development?
2. What size tract is desirable?
3. How important is the relation of the tract to the city plan?
4. What general principles should control the division of the property into zones, that is, the selection of areas for industrial and railroad development; of open spaces and public reservations, stores, public building sites, homes, etc.?
5. What determines the location of streets?
6. What are the best sizes and shapes of blocks and lots?
7. Which are the most desirable house types?
8. Should the tract be designed so as to be convertible, that is, adaptable to a use other than that for which the plan was made?

Selection of Site

The first step, namely, the proper selection of a site for an industrial village, is one that is often taken without due regard to the purpose of the development and a consideration of its relation to the steps which must follow. The skill and experience which are of service in the laying out of the property would be of even greater service if employed in time to have a part in the selection of the land.

In selecting land for industrial housing, the points of greatest importance are as follows:

Location. Usually it should be suburban or out of town, or actually in the open country. It is an advantage if the section is within walking distance of the factories, which in many cases should themselves be moved to an out-of-town location.

Cost. The value of the land should be low: for unskilled workers, $500 an acre or less; for skilled workers about $1,000 an acre.

Size of Tract. In order to provide for a complete local community giving the necessary streets, open spaces, public building sites, and the other features of neighborhood life; also to take care of the cost of the indispensable utilities, such as water supply, sewage disposal, etc., the tract should be usually not less than one hundred acres. Two hundred acres is even better. In some cases a thousand acres would not be too much.

Boundaries. The boundaries in the case of a tract with a strongly marked character should usually follow the topographical features. Unless streams or water courses are wide, both sides should be included. So also with main streets. If they are located on the boundary of the property, the development should include both sides of the streets and the boundary of the tract run to the back line of the surrounding lots.

Topography. The topographical character of the land is likewise of great importance in the choice of a site. If it is too flat, the result is apt to be monotonous and even ill drained. On the other hand, if it is too broken or steep, the development is inconvenient and costly. A slightly undulating or rolling topography is on the whole best for the purpose. Furthermore, land which is very flat can often be better used for factories, and land which is very broken is better suited for parks and public reservations. Marsh land, if it is to be used, is also apt to be better suited, when reclaimed, for factories or parks.

Streets and Roads

In making a plan for a village, the first act usually, after the choice of the tract and the preparation of the survey, is to study the property with a view to the location of streets and roads. Although a good street system is of primary importance to convenience and economy in a village, its establishment has not usually been presumed to involve any special knowledge or skill beyond that of the surveyor, nor of any different point of view from that of the real estate operator. Most of such planning in the United States has been undertaken from the proprietary standpoint. It has been done for the owners of the land, and largely with a view to early and profitable sales. The importance of the street rests in the fact that it is the channel of all the ordinary means of public circulation and public service; that it is essential to the profitable development and use of property; that only through the opportunities it offers can there be any broad or attractive expression of community life, and that only through a comprehensive, well ordered system of streets and roads can the functions of the town or village be performed with economy and efficiency.

Every decision with regard to the street is important,—its location, its width, its subdivision, its grade, its planting, its lighting, etc. With few exceptions these decisions concern the general public far more than individuals or groups of individuals who happen to reside or own property on the particular street under consideration. Different streets have different functions, and practically every street is related, or should be, to some other street. These varying functions require varying treatment, espe-

cially with regard to street widths. In most communities the area given up to streets is ample, but its distribution has been arbitrary and accidental. The requirements of local streets, in which classification most village streets are included, are different from main thoroughfares, or even secondary streets. The local street should not be broad, and to make it so incurs needless expense for grading and paving, as well as waste of land. If the local street is kept narrow, it acquires a quality more distinctively domestic. It is cozier and more attractive. There are many good examples of local streets laid out with a total width between property lines of 40 feet or even less, the roadway itself being not more than from 18 to 24 feet.

In planning the street system, opportunity should be sought for creating minor public open spaces and appropriate sites for public and semi-public buildings. The selection and planning of such features, or planning with a view to their establishment in the future, should be a part of the study of the street plan. Both the convenience and the effect of public buildings and small open spaces is largely lost without suitable approaches, giving advantageous viewpoints.

Sizes and Shapes of Blocks and Lots

The size, shape, and proportion of blocks are of great importance, especially from the economic point of view, and are controlled, of course, mainly by the location of streets and roads. Some variety in the shape and size of blocks is desirable, and often economic. It is preferable, however, to keep them fairly near to a rectangular shape, avoiding sharp angles. The depth of the block should seldom be more than from 200 to 300 feet, and the maximum desirable length is between 500 and 800 feet.

There is a decided advantage in east and west frontages for houses, especially in closely built sections. This applies, however, to northern climates only.

The size, shape, and proportion of lots are, of course, dependent largely upon the size, shapes, and proportions of blocks. Here again, within limits, varieties and differences are desirable, thus supplying different demands. A fair minimum for lot widths would be 14 or 15 feet for group dwellings, 25 to 30 feet for semi-detached dwellings (each unit), and 40 to 50 feet for detached buildings. The minimum depth of lots in these classes should range from about 80 to 100 feet. There is a direct relation between size of lots and the utilization of a portion of the interior of blocks for playgrounds or allotment gardens. This relation should be kept in mind in any attempt to estimate the justification or value of one or the other.

Some examples of American city practice in the matter of lot sizes are given below from a study undertaken a few years ago by the National Conference on City Planning. Village and town development should be more liberal.

Berkeley	50 by 159 ft.
Boston	50 to 80 by 250 to 300 ft. originally
	15 to 25 by 50 to 65 ft. now.
Bridgeport	30, 40 to 50 by 100 ft. (few, 125 ft.)
Brookline	40 to 60 by 90 to 100 ft. (majority)
Chicago	50 to 80 by 160 to 180 ft. originally
	25 to 75 by 125 ft. now.
Cleveland	40 to 50 by 100 to 150 ft.
Detroit	50 by 100 to 190 ft.
	30 by 100 to 125 ft.
Kansas City	25 by 150 ft., and larger
New York	25 by 100 ft., Manhattan, Bronx
	20 by 100 ft., Brooklyn, Queens, Richmond
Newark	25 by 100 ft.
	Few 20 by 100 ft.
Philadelphia	14 to 16 by 45 to 125 ft. mostly
	19 to 22 by 75 to 105 ft., few
Syracuse	200 by 200 ft., 33 to 100 by 100 to 200 ft.
	140 by 486 ft., 36 by 132 ft., 40 by 120 ft.

House Types

No one house or method should be endorsed as the only one, although the emphasis should be put upon the single family, self-contained house or cottage as on the whole most desirable. The choice of the house type depends upon (*a*) land values; (*b*) wages; (*c*) demand and custom.

All the types recommended should have some advantages of house construction or of lower land cost, and take into account the fact that different people have different tastes and preferences, as well as different needs in housing, as in other matters. What is best depends upon conditions and circumstances and cost.

The schedule given below shows the relation of the cost of lots and houses to wages and rent. Workingmen receive approximately from $15 or $16 to $25 or $30 a week. If they receive, say, $15 a week, and we assume that they can afford to pay $15 a month rent, the total investment in house and lot should not exceed $2,000. This allows about $400 for an improved lot (say, 40 feet in width) and $1,600 for the building. If regular savings are to be made toward the purchase of the house, the wages should average higher than the figure quoted. The investment would thus yield annually the usual 10 per cent gross, or from 5 to 6 per cent net, according to local conditions. The same comparisons can be made with the other classes shown on the schedule receiving wages of $20, $25, or $30 a week, or intermediate amounts.

This schedule is based upon a minimum annual wage of $800. Bulletin No. 76, Treasury Department, U. S. Public Health Service, makes the following statement:

"Several studies by various authorities on actual conditions in workingmen's families tend to agree very closely that unless a family of the average size

(father, mother, and three dependent children) has an annual income of $800 or more, it cannot maintain a healthful standard. This conclusion is apparently confirmed by statistics of expenditures in workingmen's families which show that the point of adequate subsistence is not reached until the family income is approximately $800 or more."

GENERAL SCHEDULE SHOWING RELATION OF THE COST OF LOTS AND HOUSES TO WAGES, RENT, AND SAVINGS

Lots, Improved (except paved roadway)	$400	$500	$600	$700
Houses	1,600	2,000	2,400	2,800
Total house and lot	2,000	2,500	3,000	3,500
Wages				
Per week	15	20	25	30
Per year	800	1,040	1,300	1,560
Rent				
Per month	15	20	25	30
Savings				
Per month	4	5	6	7

MINIMUM LOT AND HOME FOR NORMAL FAMILY

Minimum Lot

Terrace Row — 15 to 16 ft. wide, 80 to 100 ft. deep (alley)

Semi-detached (each) — 30 to 40 ft. wide, 80 to 100 ft. deep

Detached — 40 to 50 ft. wide, 80 to 100 ft. deep

Minimum House

4 rooms: living room, kitchen, two bedrooms, and bath.

5 rooms preferred: living room, kitchen, three bedrooms, and bath; allows for separate bedrooms for older children of different sexes.

HOUSES PER ACRE

It is not practicable to fix any absolute limit to the number of houses to the acre. Very much depends upon the sizes of the houses and the arrangement. Furthermore, it is not easy to weigh the disadvantages that might arise from enlarging cities to such an extent as would give a much lower number of houses to the acre. One may safely say, however, that the desirable maximum would be between ten and twenty houses to the net acre, that is, the building land used for house-lot purposes. Twelve houses to the net acre has proved to be about the right number for cottage development. This figure has been fairly well tested in the garden villages of England, as well as in this country. For houses built in rows or short groups, the density should not usually exceed a maximum of twenty houses to the net acre.

COST PER ACRE FOR DEVELOPMENT*

	Per Lineal Foot	House Connections
Sewer	$ .50	$28.00
Water	1.25	18.00
Sidewalk	.60	----
Rough grading streets and curbing	1.65	----
	$4.00	$46.00

Terrace Row Type

House on 15-foot lot at $4.00 $60.00
House connections 46.00
16 Houses per acre at $106.00 $1,696.00 per acre

Detached House Type

House on 40-foot lot at $4.00 $160.00
House connections 46.00
6 Houses per acre at $206.00 $1,236.00 per acre
(Depth of lot assumed to be about 100 feet.)

* Estimate based on figures for Akron, Ohio, September, 1916.

BUILDING DISTRICTS AND RESTRICTIONS

Districting or zoning is, after all, little more than an extension and wider application of the principle of restrictions. This principle is well understood, and has long been applied by private owners of property, and to some extent by the public authorities. It is a principle that is particularly well understood in the United States by real estate operators. The restrictions placed upon the purchaser in the conveyance of property often include a long list of the kinds of business which are classified as nuisances, and which may not be established or maintained upon the property. These restrictions also include regulation as to stables and garages, fences and walls, setback of buildings from the street and from lot lines, the minimum cost of buildings, easements, and rights of way for public utilities, and in some cases even the approval of house plans and specifications. The point of view with regard to these restrictions is indicated by the fact that the real estate operator now often refers to them as "safeguards."

LOVELAND FARMS
YOUNGSTOWN OHIO
JOHN NOLEN LANDSCAPE ARCHITECT HARVARD SQ. CAMBRIDGE MASS

STATISTICAL STATEMENT

LOTS	ACREAGES		PERCENTAGES		LOTS
Residential	161.78		67		Number of House Lots 868
Business	14.81		6		Houses per net acre 5.37
Total		176.59		73	Average Lot Area .188 Acres
SEMI-PUBLIC PROPERTIES					
Churches	.71		.3		Normal Lot Size 30 ft x 150 ft
Total		.71		.3	Houses per gross acre 3.58
PUBLIC PROPERTIES					
Schools	2.8		1		
Playgrounds					
Parks	8.29		3.6		
Fire Station	.68		.3		
Total		11.77		4.9	
STREETS					STREETS
Main Width 60-70-80 ft.	16.43		6.8		Main Length 2 miles
Local Width 30-40-50 ft.	36.50		15.0		Local Length 6.7 miles
Total		52.93		21.8	Total 8.7
TOTALS	242.00	242.00	100	100	

Remarks. — Principal playground located beyond limits of Loveland Farms. Lots larger than usual. Village intended for higher paid foremen and superintendents. Poland avenue, a boundary street, is a main thoroughfare to city.

It has become evident, however, that we cannot depend upon private restrictions in deeds imposed by the landowner. At best his action is applied only to very limited areas, and even when most public spirited is not always intelligent. His chief motive must be profit. He cannot be expected to have consistent and permanent concern for the results of his methods upon the future occupants of the property, nor upon the general public. Furthermore, no matter how large his holdings, he has only the legal power of a private citizen.

One of the most approved forms of restrictions is that of a building line establishing the setback for the buildings from the street. In some places this setback is considered a part of the street and publicly owned. In others it is restricted private property. The width of this strip ranges from 5 to 25 feet, or more. If too deep, it would be wasteful and out of proportion to the size of the lot. It would also make service connections expensive. It appears to be generally agreed that this building setback should not be uniform throughout the property, but should vary in relation to the width of streets and the depth of lots. Sometimes it should vary on the frontage of a block, giving a varying arrangement of setback to the houses, and increasing the interest of the street scene. There is fully as much reason to establish distances between buildings on the side line as on the street. A good standard is 18 to 20 feet between buildings, that is, an average of 9 or 10 feet from the building to the side line.

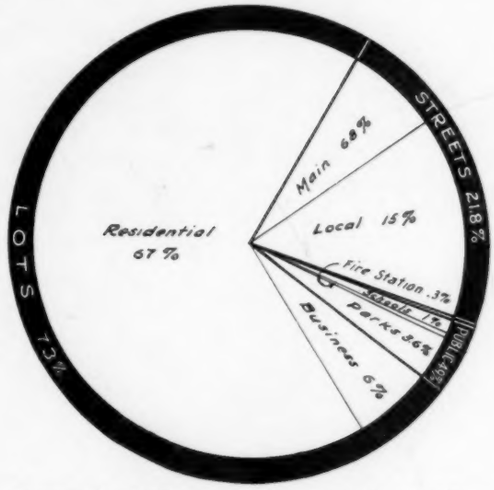


Diagram Showing Percentage of Property in Loveland Farms for Various Purposes

In the investigation of the National Conference on City Planning referred to above, some of the effects of restrictions in various parts of the country were stated as follows:

Berkeley	Voluntary restriction works well toward increasing values.
Bridgeport	Lack of restrictions permitted bad housing conditions to grow.
Louisville	Colored problem has dictated restrictions.
New York	Lack of restriction as to per cent of lot area covered has been detrimental.
Newark	Restricted districts have increased in value; others have not.

Typical Statistical Statement

An important test of success in the laying out of an industrial village is the percentage of property used for various purposes, — lots, semi-public properties, public properties, and streets. An example here reproduced of this type of development is given in Loveland Farms, a development of the Youngstown Sheet & Tube Company.* It will be seen that the lots comprise 73 per cent of the property, the streets 21.8 per cent, and the public and semi-public properties 5.2 per cent. The principal playground is located beyond the limits of this particular tract, which reduces somewhat the percentage of public property; and the main thoroughfare is a boundary street, which brings the street percentage slightly below the normal average, which is about 25 per cent. The number of house lots is 868 — 5.37 per net acre. These lots are above the normal lot size, the village being intended for the higher paid foremen and superintendents. In the long run it can be shown that good planning pays, provided everything is taken into account.

Summary of Steps

The steps for a complete community development may be summarized as follows:

1. An accurate topographical survey at scale of about 50 feet to the inch, with contours at intervals of from 1 to 5 feet, according to circumstances, is the fundamental basis of the plans.

2. The reservation of public lands, playgrounds, open spaces, parks, etc. An important part of this reservation would usually be the natural features of the property.

3. The subdivision of the area into blocks of well dimensioned lots, according to requirements.

4. The setting aside of appropriate sites for public and semi-public buildings, and for community centers.

5. A system of roads with sidewalks, planting strips, etc., differentiated into main and minor streets.

6. An electric car or motor bus service approaching within a quarter of a mile of every lot.

7. A complete system of sanitary and storm water sewers,—water, gas, electric light, and telephone prearranged. If financially possible, wires should be located underground.

8. The establishment of building lines and other suitable restrictions throughout the property.

9. The reasonable regulation and control of the location of buildings and of their architecture.

10. The detail planning for all roads, parks, street intersections, and if possible, also, of the private property.

* See also plan of Loveland Farms, *The Architectural Forum*, January, 1918, page 10.

In conclusion can we not be reasonably sure that the industrial town or village of the future will make better provision for an orderly development; that it will provide for the convenient circulation of men and goods; that it will exercise a larger measure of official control in so vital a subject as transportation; that better standards of public work will increasingly prevail? May we not also safely predict that recreation will be better understood and provided for, and that all the problems of preserving and enhancing child life will become almost the main care of society? The characteristic American home of to-day, as we see it almost anywhere is not, we can be sure, to be the characteristic home of the future.

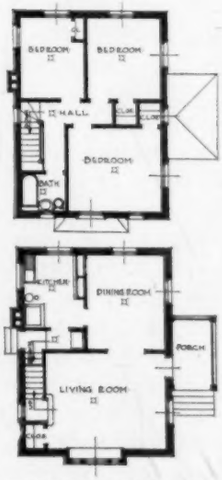
If these changes are to come about, they must not only be forecasted, they must be patiently and definitely planned for; and difficult problems of design, of construction, and of distributing the great cost thereof must be met. Just such problems as industrial housing involves, problems also of the adjustment of one interest to another, and of the reconciliation of individualism and collectivism, or even socialism, must be met with courage and ultimately mastered.

No one who has worked on such problems can fail to realize that if we are to march steadily forward in community planning and community building, we must recognize afresh that radical changes in our practice can be brought about only by changes in public opinion. Therefore we must find more and better ways of forming intelligent public opinion and of giving it effective expression.

Street Elevation Showing Placing of Mechanics' Houses to Fit Contour of Land

Floor Plans of House at Left

Perspective Showing Houses for Superintendents of the Company



Typical Plans of Houses Above

Elevation Showing Grouping of Houses and Hotel at Foot of Montclair Avenue

Any special grouping of houses with varying set-backs was largely eliminated by the steepness of the grades, but great care and study were expended in the grouping of different types on each street to make attractive street views and vistas

DEVELOPMENT OF THE MIDVALE STEEL COMPANY, COATESVILLE, PA.

W. Leslie Walker, Town Planner and Architect

The Development of the Midvale Steel Company, Coatesville, Pa.

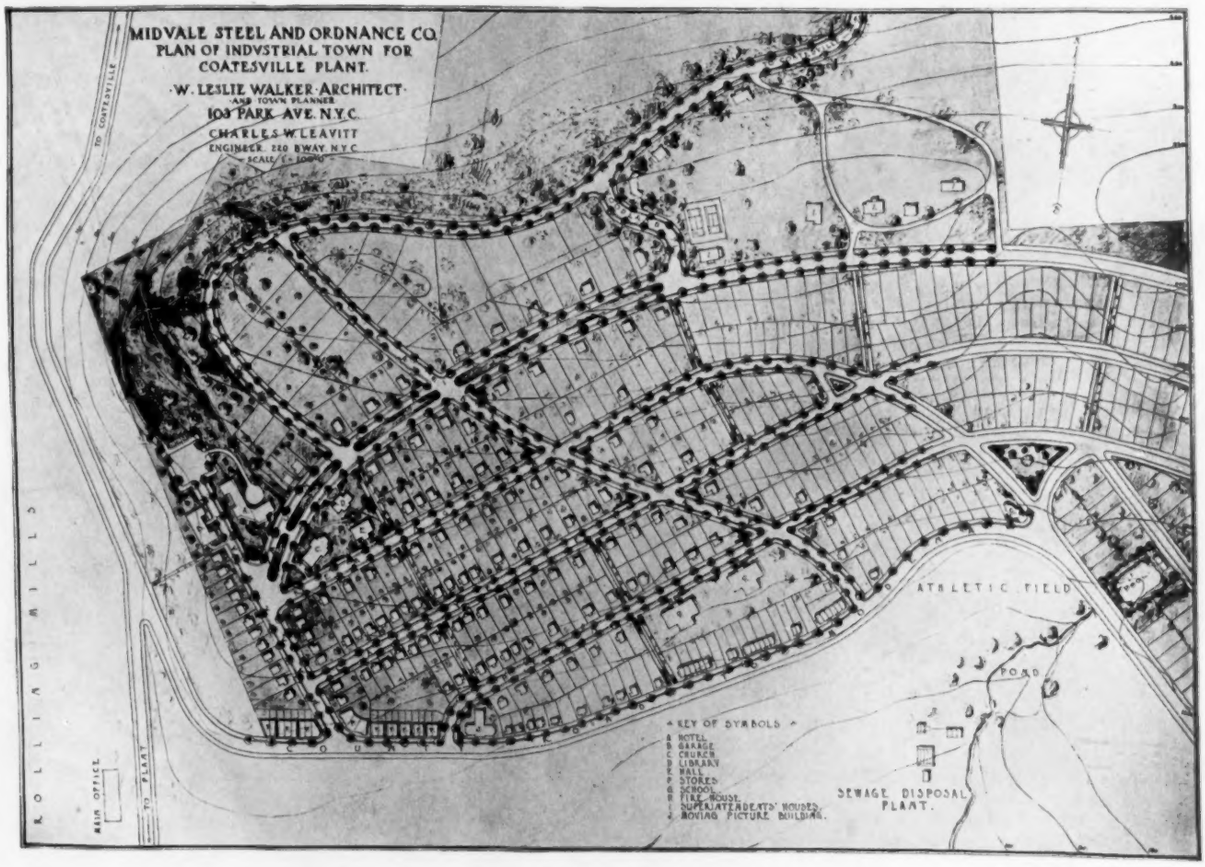
W. LESLIE WALKER, ARCHITECT AND TOWN PLANNER

THE Midvale Steel and Ordnance Company in deciding to undertake the work of providing an industrial town did so with the idea of providing not only houses, but making a town complete in all its appointments, and in such a manner as would contribute in the greatest degree to the health and happiness of its residents in the full realization that such conditions not only make better citizens but more efficient workers.

View of Development under Construction Looking Up Montclair Avenue

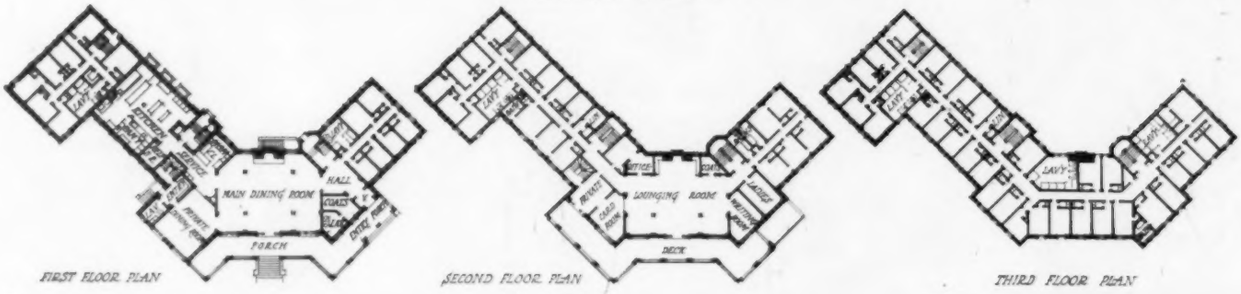
The only site available for this town was a steep hillside farm of approximately 100 acres, lying a quarter mile distant from the works and adjoining the city of Coatesville. The problem as it was presented to the architect was in many respects an exceptionally difficult one. The entire site, for example, had not a tree on it; moreover, the natural slope of the property was exceptionally steep, from 15 to 20 per cent grades, public utilities of every sort had to be supplied throughout the tract.

In other respects Mr. Walker was fortunate—the company wished to do the work on a broad gauge policy and selected him as their town planner and architect, entrusting him to the full responsibility for town planning, utilities, and buildings necessary for creating a well planned village, and they were willing to accept Mr. Walker's advice that, in the solution of their problem, practicability and sound economy must come first, and then architecturally it should be made as good as the conditions would permit.



Plan of Industrial Town for Midvale Steel and Ordnance Company

General View of Exterior



Lounging Room

Dining Room

MIDVALE HOTEL, INDUSTRIAL TOWN OF MIDVALE STEEL COMPANY, COATESVILLE, PA.
W. Leslie Walker, Architect

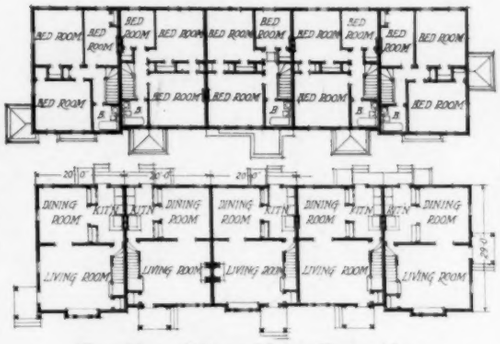
MIDVALE DEVELOPMENT, COATESVILLE, PA.
FOR MIDVALE STEEL & ORDNANCE CO.
TYPES: A³-A⁴-A¹-A⁵
W. LESLIE WALKER, ARCHITECT, 103 PARK AVE. N.Y.

Perspective Showing Typical Mechanics' Houses of Six Rooms and Bath

These two points—that they were willing to embark upon a broad gauge program of real town-planning proportions, and that they were ready to centralize authority and responsibility — were of the greatest possible significance in making for the success of the project.

Group of Five Houses

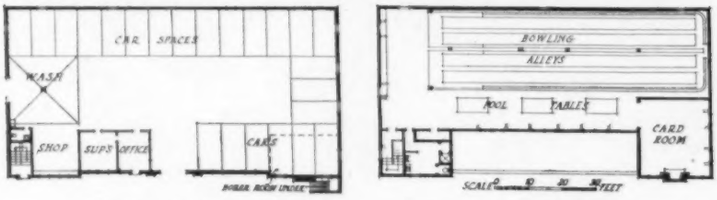
The town plan, which must obviously be considered only in relation to the topographical map, was studied from every angle so that the site might afford the best possible grades and circulation, the most advantageous disposition of lots and open spaces, and the easiest gradients for thoroughfares. The plan of this section known as the Midvale Development shows the residential streets generally following the contours, with no grades heavier than 10 per cent, even on the parkway which sweeps up over the hill to connect with the street system of Coatesville itself. Street sections are varied in width according to use, with a range from 50 feet for the narrowest to 90 feet for the parkway. Especial interest attaches to the 30-foot wide parked walks, which give cross connections through the middle of blocks. Too steep for streets, they give exactly the needed access for men going to and from the plant.



Floor Plans of Group House Shown Above

All items entering into street construction reflect the policy

View Showing Mechanics' Houses Grouped on Steep Grades



Elevation and Floor Plans of Garage and Community Club Building

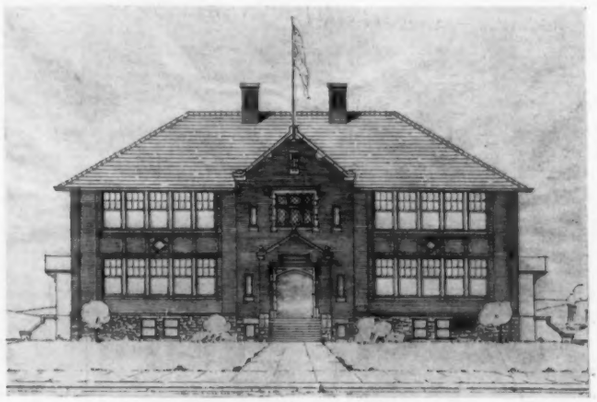
of building for permanence and low upkeep, rather than for low first cost. Such items, for instance, are concrete curbs, macadam asphalt pavements, a complete and modern sewage disposal system, storm water drainage system, water, gas, and electric mains (the latter all run underground), provision of open spaces, including a six-acre hillside park, and a broad tree and shrub planting program which will ultimately make up for the deficiencies of the natural site in these respects.

Mr. Walker, in charge of town planning and the utilities, retained Mr. Charles W. Leavitt, the landscape engineer, in carrying into execution the engineering features.

Provision has been made for much more than the demands already in sight. While the initial building program included only 70 houses and a hotel,—a home for over a hundred of the unmarried men, as well as a meeting and dining room for the staff superintendent and his staff—the general plan for the village shows accommodations for about 500 houses; it shows, too, reservations for the buildings of a public and semi-public character which must presently be supplied and sketches for which have already been made.

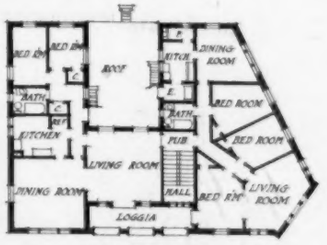
For the houses themselves the policy of the company, backed by the advice of the architect, eliminated frame

Perspective of Public Library

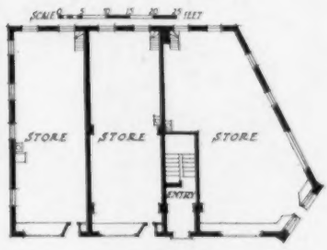


Elevation of Midvale School

Perspective of Store and Apartment Building

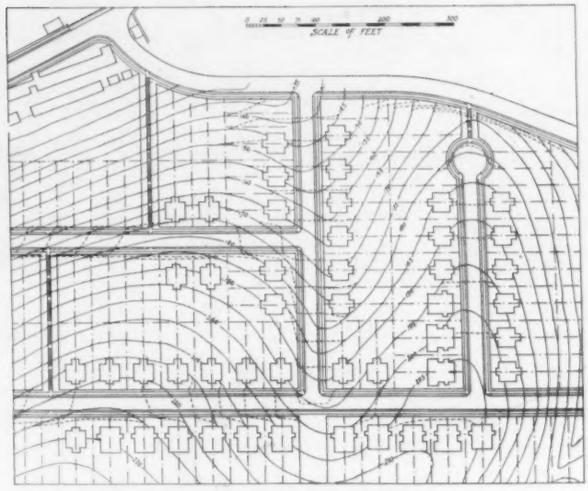


Second Floor Plan



First Floor Plan

construction at the beginning. After careful consideration of the various materials the decision was fixed upon brick for exterior walls and slate for roofs. Another point of policy dictated the use, in this first development for skilled workmen of only single family, detached houses. The lots are of considerable variety in size, from 40 by 100 feet at the smallest to 60 by 150 feet at the largest. The houses themselves are of two general types, one a six-room house with bath, and complete in all details down to copper screens. The other is a larger type, designed for occupancy by the superintendents of the company. In both cases, ingenuity has been used in creating variety through different exterior treatment and roofing.



Plot Plan of Laborers' Housing Development

The steep grades make it practically impossible on a majority of the lots to provide private garages. To supply the need which will presently become a general one, designs are being made for a community garage. It will be centrally placed, and, besides its primary function, will afford, on the upper floor, general recreation rooms, with bowling alleys, pool tables, etc., for the use, first, of the men who live in the hotel-club nearby, and second, the other members of the community.

On another slope at the opposite side of the plant is a second group known as the Brandywine Development, where foreign labor is being provided for. These houses are of 4, 5, and 6 rooms each, arranged as semi-detached buildings, in lots 25 by 100 feet for each family. Otherwise the accommodations are virtually those of the houses in the other, more spaciously planned group. Seventy-five of these have already been built—they were all occupied before completion, and more houses as well as stores and other necessary buildings are to be started at once. In this development the houses are of hollow tile, and efficiency of plan and low maintenance have been the controlling factors. Both here and in the Midvale Development the costs have been kept at a surprisingly low figure. And, curiously enough, the unit prices in the two groups are almost exactly alike, viz., 19 cents per cubic foot for the houses complete, with decorations, screens, and electric fixtures, and including walks and finished grading. The equality of cost in two groups of somewhat differing accommodations is explained by the increase in prices during the six months which elapsed before the second and simpler group was undertaken. Additional work contemplates the use of a type suited to the steeper grades as shown below.

View of Laborers' Development under Construction

Two-Family Laborer's House

View of Street in Laborers' Development Looking toward Mills

The Architect's Relationship to an Industrial Housing Development

By PERRY R. MACNEILLE

GENERALLY speaking, it would seem that any discussion of this subject might begin and end with a consideration of the æsthetic factors of town-planning and building design as they relate to the problem of an industrial housing development. A more careful analysis of the problem, however, and of the many factors which bear upon its proper solution, will show that the function of the architect reaches a far broader scope.

As a realization of this fact crystallizes in the minds of those who are about to undertake the provision of homes for workmen the demand for the services of architects who have specialized in this branch of the profession becomes more insistent.

From the æsthetic standpoint the value of an architect's services may be judged by simple comparison of housing developments which have been carried out with and without architectural supervision, and little comment is necessary on this particular phase of the subject.

Aside from the solution of the problem from an æsthetic standpoint, the architect who would successfully undertake an industrial housing problem must be possessed of a thorough knowledge of what should constitute proper living conditions for the various classes of workmen whom he is about to house. He must know their national characteristics, their likes and dislikes, and their various conceptions of what a home should be. He must study the factors of segregation, welfare, and community existence, striving always to produce homes which, harmoniously grouped, will result in the desired encouragement of proper community life, insuring a healthy and contented working population.

Space and time prohibit the detailing of the many factors which enter into the proper development of such a project. Sufficient to say that the selection of site, the layout of streets, the provision of community facilities, recreational features, and the design and equipment of homes all bear importantly on this subject. The policy of the owing company must be determined upon, whether their houses are to be sold or rented. Provision must also be made for the maintenance of the village after it is completed, and well defined policies must be clearly established and firmly adhered to if full success is to be attained. It will readily be seen, therefore, that in addition to the proper equipment for town-planning and home-designing the architect must be possessed of a thorough knowledge of the social conditions and needs of the workmen in order that he may enter his broader relationship to an industrial housing project.

In an organization for the carrying out of a large industrial housing project it is obvious that there must be a central executive charged with responsibility for the successful working out of the whole plan, who will report directly to the official appointed by the owning company. This executive can be the architect, the engineer, or the contractor; but since the bulk of the work to be done is of an architectural rather than of an engineering nature, and since the contract for the performance of the work places responsibility on shoulders higher up than the contractor's, it is logical that the architect should be the one in supreme charge.

Admittedly, the architect who would properly relate his functions to the solution of a housing problem must take on many activities outside the usual architectural scope — activities for which he must be especially prepared and equipped through the means of careful, analytical study of every feature and development in this special field. A brief outline of the general method followed in making an analysis of housing conditions and needs in a certain locality will serve as additional proof of the importance of an architect's relationship to a housing problem.

Housing problems usually develop in connection with individual manufacturing enterprises or in industrial centers where several factories maintain a large labor population. The need for relief is shown by a high percentage labor turnover, and by a constantly shifting labor force, which seriously handicaps production and efficiency. At this point, when the need is distinctly felt, the architect who is also a housing and social expert should be called in.

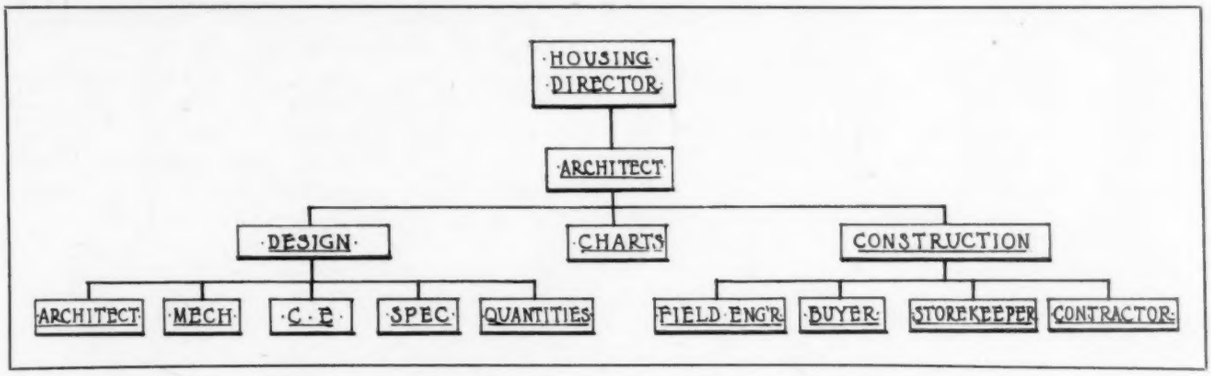
His first activity is to analyze conditions so that intelligent relief may be given at the lowest possible expense.

Where a house shortage exists, there are several methods for obtaining relief which should be applied before actually constructing houses. Among these are the questions of bettering existing transportation facilities or providing new facilities and encouraging local interests, such as builders, building loan societies, and similar enterprises, by giving rental guarantees or through other means. The question of transportation involves a careful analysis of possible existing housing in surrounding towns which might be used if better transportation facilities were provided.

In other words, every possible means for providing housing without expense to the manufacturer should be carefully gone into and utilized wherever feasible. After such action has been taken, and all existing forces toward a bettering of conditions have been set into coordinated action, the actual housing problem will automatically present itself.

At this point there enters the real estate aspect, which includes the selection of properly located tracts of land, bearing in mind relative distance from the factory and from community facilities, such as stores, churches, and recreational activities. The natural possibilities of available tracts of land are next for consideration. These include topographical features, nature of soil and drainage, general adaptability, also sewage and availability of public utilities. Thereafter the subjects of town-planning and design, together with organization, follow in logic sequence.

In order that the importance of the architect's relationship may be fully realized, and to give some understanding of the broad functioning which this entails, the following paragraphs will outline the general organization and methods which have been evolved for handling large industrial housing projects.



Graphic Chart Showing Proper Organization for Conducting Housing Developments

The functional chart shown in conjunction with this article will serve to explain graphically the general organization necessary for handling a large project.

In the first place, the architect should be put in supreme charge of the project, reporting only to an official or committee appointed by the owning company. The architect's work can then be sharply divided into two classes:

(*a*) That which has to do with design.

(*b*) That which has to do with construction.

The design should be in charge of the chief designer in the architect's office, and he will have under him a force of draftsmen, civil and mechanical engineers, and specification writers, as well as a quantity surveyor. The chief designer's duties will be to prepare plans for the architectural and mechanical portions of the work, to write specifications, and to prepare lists of materials. This work should be performed by experts in each line, and the final design should be submitted for approval of the official appointed by the owning company.

That portion having to do with construction should be in charge of a superintendent of construction, who will be served by the field engineers, the buyer of materials, the stores keeper, and the contractor.

The superintendent of construction must be responsible for scheduling and planning the work. This scheduling should be done graphically and in a manner to show the complete plans for the conduct of the work in advance. These graphical charts should be available for the use of the buyer, who can make detailed charts of his purchases to meet the needs of the contractor. Perhaps the most important function of the superintendent will be to see that these charts are made far enough in advance to enable both contractor and buyer to perform their respective functions on schedule time.

Furthermore, the charts referred to should be laid out so that they will give weekly information upon which executive action can be taken. The object of these charts is not to record past accomplishments, except insofar as this aids future activity. Their subject is mainly for the purpose of indicating in the most condensed form what is to be done and to point to weak points in the work. They are a means of greatly multiplying the capacity of the executive by showing him where his effort is needed, and saving him from spending any time on those portions of the work which are moving satisfactorily.

Quantity surveying must be carefully carried out for estimating the quantities of each kind of material entering into the work. These estimates should show not only the total quantities but the quantities for each building and the rapidity of supply, *e.g.*, the quantities needed each week. These estimates should serve not only for making purchases but as an insurance against wasteful use of the material. The quantity of materials needed should be accurately estimated and, as they are delivered at the site, they should be receipted for by the stores keeper. As they are distributed from the yard to the different buildings, he should be credited and the local foreman should be charged. Then, and then only, can the responsibility for waste be fixed.

There has been no intention in this article to lay out definite rules for organization or for an analysis

of a housing project. On the other hand, its particular purpose has been to show that the relationship of an architect to an industrial housing problem can be developed to a high point of efficiency. During the past years much of the housing of workmen which has been done in this country has been carried out with little regard for æsthetic values, and without carefully analyzing cause and effect in important labor problems which have, as a definite factor in their solution, the proper housing of industrial workers.

Much of the housing which has been provided has been through the unregulated activities of speculative builders, or through the employment of contractors who construct long rows of unsightly, boxlike structures, entirely devoid of architectural merit, or any recognitions of the highly important sociological problems.

As we investigate our various industrial centers, the unfortunate results of such indiscriminate housing stand as indisputable evidence of what the relationship of the architect to the question of industrial housing should be. The proof consists in paralleling the two distinct types of results. We may do this by considering on one hand the unrestricted developments which have degenerated into slum sections; the unattractive and inefficient housing of the average industrial section where little thought has been given to the comfort of tenants and to proper maintenance, and the many rapidly depreciating groups of industrial houses which form eyesores in the neighborhood of many of our factories, and which represent large sums of wasted investment. On the other hand, we may consider the attractive garden cities of England and a few of the better developments in this country, where the dwellings are occupied by a healthy and contented working population, which serves as an excellent nucleus for the stabilization of working forces and at the same time guarantees investment return and serves in a manner beneficial, rather than detrimental, to the community.

The distinct relationship of the architect to any industrial housing problem is, perhaps, most easily shown by the natural question which comes to mind when one enters an attractively designed and prosperous industrial community:

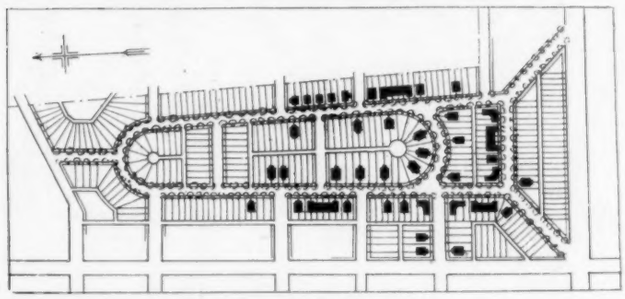
"Who was the architect?"

IT IS sometimes of equal value to know "what not to do" as to know what to do. The above illustration is given as an example of the former. These houses were built some years ago by a manufacturing company for their employees. They are in barracklike groups, accommodating ten families each and totaling approximately 250 families. They represent a tremendous waste of invested capital as they have depreciated to such an extent that it will soon be necessary to remove them entirely. This is due, in large measure, to the fact that so little constructive thought was expended in their development that their influence is depressing to the occupants rather than inspiring as it should be. They rent for $6 a month per family and are occupied by foreign works. — The Editors.

Elmwood Park, Bethlehem, Pa.

GEORGE S. WELSH, ARCHITECT

THIS development at Bethlehem, Pa., is the outcome of successful welfare work carried on by Weston Dodson & Company, coal operators, in connection with their mines in Pennsylvania. Mr. T. M. Dodson, vice president of the Company, has for fourteen years been interested in the work and his success prompted the Company to extend its efforts beyond its own mining territories. For this purpose the Dodson Realty Corporation was formed. The present development has no connection with the coal mining industry, but was instigated by the great demand for housing workmen of the Bethlehem Steel Company. The enterprise is not connected with that company, however, although its employees are occupants for the most part of this group of houses.



General Plot Plan of Development

The area developed comprises 16.60 acres, of which 12.41 acres are in lots, 3.51 in streets, and .68 in alleys. There are twelve lots to the acre. The land development has been completely done and the costs per acre for various items are as follows: sewage disposal, $1,980; concrete sidewalks, $242.31; concrete curbs and gutters, $252.41; street lighting, $148.20; street construction, $903.61; cinders in alleys, $48.19; planting, $36.44, and hedges, $69.27, making a total of $3,680.43 per acre. The cost of sewage disposal was more than would ordinarily be incurred and was occasioned by special conditions. There are no sewers in Bethlehem which made it necessary to use sumps. Underlying the town is a lime-

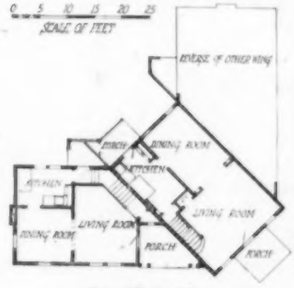
General View Looking Across Curved Street at Northern End of Development

General View Showing Location of Group and Semi-Detached Houses

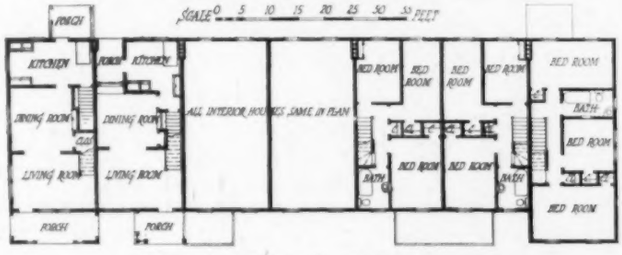
stone formation which provides perfect drainage if a crevice can be found. In this instance a septic tank was installed underground near the house and a few feet from it a 6-inch hole drilled until a crevice was found. This necessitated drilling sometimes to a depth of from 40 to 125 feet. The method has been particularly successful but naturally expensive. When the cost of street lighting and other items has been refunded by the city, the development costs will be reduced to about $3,000 per acre. There are in the development 5,659 feet of streets, 8,380 feet of sidewalks, 4 feet wide, and 3,800 feet of alleys.

The houses are in most cases semi-fireproof in construction. The foun-

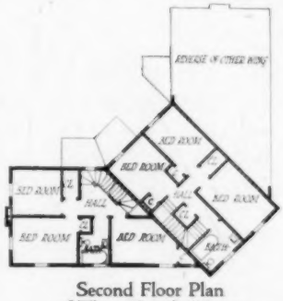
Three-Family House on Corner Lots



First Floor Plan of Three-Family House



Floor Plan of Seven-Family Group House



Second Floor Plan of Three-Family House

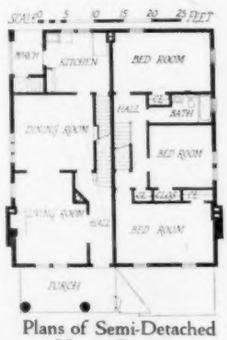
Principal Elevation of Seven-Family Group House
George S. Welsh, Architect

Views of Typical Semi-Detached Houses of Similar Plans

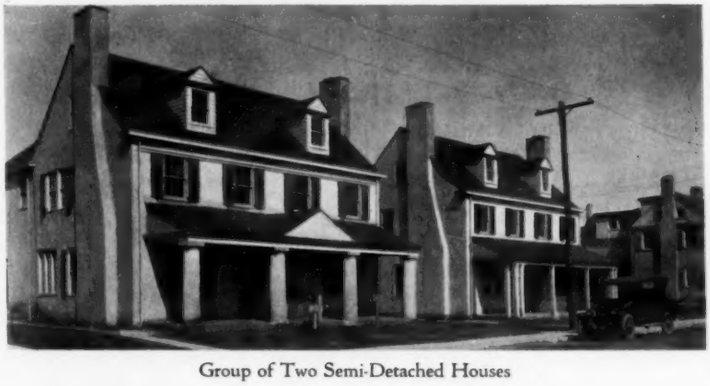
dations are of 8-inch interlocking hollow tile and have proved satisfactory under various tests, while effecting a saving of $25 to $50 on each foundation over other methods typical of that locality. The exterior walls are mostly of brick textured hollow tile. For variety of effect some houses are stuccoed, and dormers on others and a few single houses are of white painted shingles or of wide siding.

Stucco Finished, Semi-Detached House

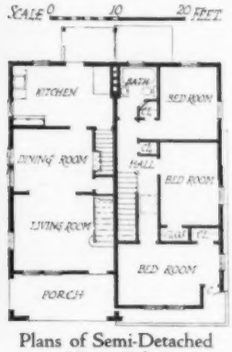
The work has been carried out in four different groups and the buildings total 167. The first three groups were built by contract and the last group of sixty was constructed by the Company's own force in order that they might secure actual costs and accurate data. The house shown at the extreme right of the illustration on the top of page 112,



Plans of Semi-Detached House Opposite



Group of Two Semi-Detached Houses



Plans of Semi-Detached House Below

General View Showing Grouping of Semi-Detached Houses in Center of Block

George S. Welsh, Architect

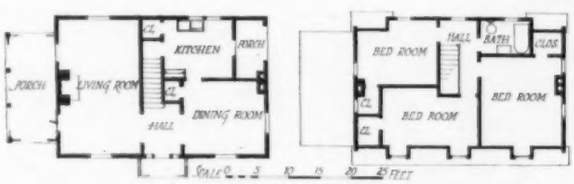
Single Houses of Seven Rooms Having Similar Plans

and also a variation of the same in the center of the illustration at the bottom of page 113, cost in October, 1915, $4,040, and in March, 1916, $4,272. The estimated cost on April 1, 1917, was $4,856, and the actual cost Nov. 1, 1917, was $4,943. These prices are for one semi-detached dwelling. The same proportion holds throughout the development and is a very fair average in showing the increased cost in the last few years.

Floor Plans of Single Houses Above

The houses are sold on the following basis: $150 is required as a first payment and monthly payments thereafter, amounting to $1 for each $100 of principal until the mortgage has been discharged. The payment on a house selling for $3,500, with lot, would be, for instance, $35 per month, which includes all expenses, such as taxes, interest, water rates, etc. The selling prices range from $3,000 to $6,000.

The houses are of an agreeable type of architecture developed from the traditional Colonial types of Pennsylvania. They are mostly of the semi-detached type, although a number of attractive row houses with 16 feet frontages and an interesting three-family house for corner lots are introduced. The group house has been found the most economical in construction, affording larger rooms and better methods of building than single dwellings of equal cost, and its effect in street elevations is much more valuable.



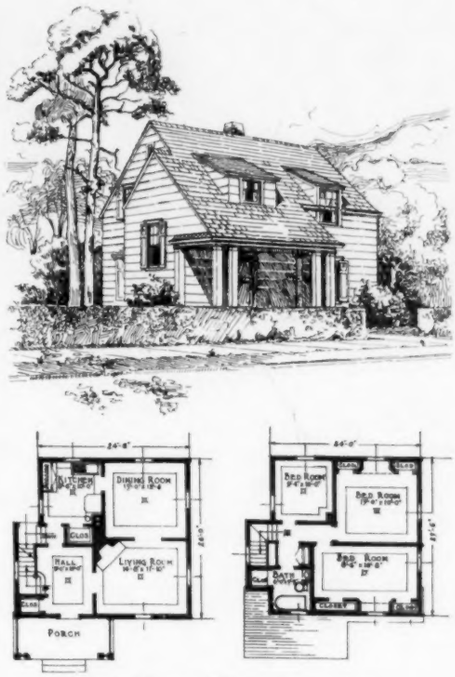
Floor Plans of Single Frame House Below

General View Showing Location of Single Houses at Ends of Blocks
George S. Welsh, Architect

Housing Types for Workmen in America

By CHARLES C. MAY

IN attempting any sort of survey of the various types of house which have been and are being used to house the workmen of this country, a distinction must be made at once between housing as it is and housing as it should be. Certain types of detached house built by companies even within recent days of comparative enlightenment are too primitive to meet any set of minimum standards; certain other types, like the wooden three-decker, are in themselves obnoxious and will presently be legislated out of existence. On the other hand, it must be recognized that the virtue of a type of house is by no means necessarily in proportion to its number of rooms. Some of the largest houses have been planned with least care for convenience and for proper standards of living. There have sometimes been little regard for the prime essentials in workingman's house design — that is, for economy, for simplicity, for suitability.



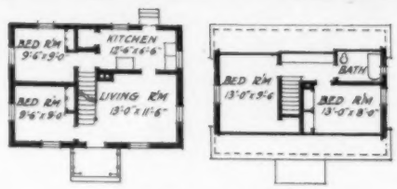
Single House of Frame Construction
Estimated to cost $4,000. 19,432 cubic feet
Mann & MacNeille, Architects

Virtually every planning problem is a combination of architecture and economics. The proportions vary from pole to pole, from the play-palace of the millionaire, where the limitations are chiefly those of the architect's imagination, to the minimum dwelling for the laborer, where architecture is at every point circumscribed by economics, and the fanciful has no place. The architect's province in industrial housing is that of the planner who must show that his habit of mind, his training have fitted him to grasp the economic as well as the æsthetic side of the problem; to prove that comprehensive planning, both in the community and in the house, conduces toward good design, a sound investment and a satisfying result.

The type of house is bound up with the value of the land it is to occupy. It has been said that generally the poor man lives on expensive land and the rich man on cheap land. What the well-planned industrial community should do is to reverse the poor man's side of the proposition and give him the chance of living on cheap land. It is generally agreed that the goal toward which we should aim is the possibility of home ownership for the workman, and that in its best form this means an individual plot of ground, a detached house, and a bit of land on which to practise gardening. This ideal, so far as land is concerned, is sometimes more easily attained for the lowest paid wage-earner than for the skilled mechanic of twice his earning power — simply because of the discrepancy in land values. The common laborer in a southern mining town can, likely enough, occupy four times as much land as the fabulously well-paid munitions worker of Bridgeport. In some fortunate instances the land value is so small as to become a negligible factor in determining the type of house to be used. Here we may attain at once the ideal above mentioned, — individual plot and detached house. Yet a small house on a big lot is not without danger where land is likely to increase in value. The land may after a time become too heavy a burden for the worker to carry, and he may see in his abundance of real estate a chance to relieve the load by putting another house on the same lot with his own. Unless restrictions prevent, this tendency is always present, and it has in the past produced some of our worst slum conditions. Even where land is cheap, then, the area given to the individual house should be carefully proportioned to the grade of workman and to his capacity to handle it.

In the majority of cases, however, the land value is a vital factor. Given its first cost, add an estimated charge for development, including amenities of planting, finished grading, etc., and a figure is obtained from which may be worked out the cost to the workman of a lot of the size proposed. Roughly, it may be said that the proportion of land cost to house should be from about 15 to about 25 per cent. In another way, working back from the price agreed upon as the maximum advisable for total selling price of land and house, there may be determined the number of square feet that can properly be allotted to each house, and, therefore, since depths of lot are usually determined beforehand, the typical lot width. Here the land value begins to bear directly upon the type of house. So long as the lot may be of a normal width, and the prospect does not

point toward a jump in land value, the detached single-family house may properly be used. Where land is more expensive, the possible lot width becomes so narrow as to force that condition which we deplore in so many of our factory towns — rows of houses set so close together that the space between is a dark slit, of worse than no value to any one. The conditions may be helped somewhat by variety of grouping — different setbacks and different facings; but generally speaking we may say that when the lot size is forced below, say 35 feet, it becomes wise to reapportion the lotting so as to include semi-detached and group houses on narrower lots, thereby giving extra space to be used for detached houses on adequate lots. The variety thus gained is, besides, a great asset architecturally, producing groups of better mass and scale than can be had by indefinite spotting with the tiny single house units.



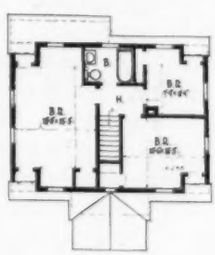
Single Frame Houses,
Kistler Industrial Village, Pa.
Mann & MacNeille, Architects
Size of house, 20 by 28 feet. Size of lot, 40 by 100 feet. Cost, $1,000 in 1916

For the dwelling itself, suitability is the prime essential. It must be, first of all, suitable to the nationality of the worker, and since our common labor is largely recruited from foreign lands, this corresponds somewhat to the grade of worker. Distinctions in the several grades of house occur largely in the living quarters, since in essentials a bedroom is a bedroom, whether the occupants be Hungarian or Italian, Pole or American. The point that is sometimes overlooked is the craving of the workman for the monumental in bedsteads. One is under the necessity, then, of either providing a wall space wide enough and high enough to take the high head of the double bed, or do as is now done in many parts of our country — install the built-in, disappearing type of bed as part of the household equipment.

It is in the kitchen that the greatest variations occur. Its size and importance in the family life may be said to vary inversely with the grade of the workman. When cooking, eating, and washing all go in the one room, to say nothing of whatever supervision there may be over the smaller sizes of children, it is easy to see that the room should be

Floor Plans of House Below

THE house at left was built in 1915 and cost $2,698. House at right built in 1916 and cost $3,134. Cubic foot cost .176 and .187, respectively. Both of frame construction, with steam heat and cellar under entire house.

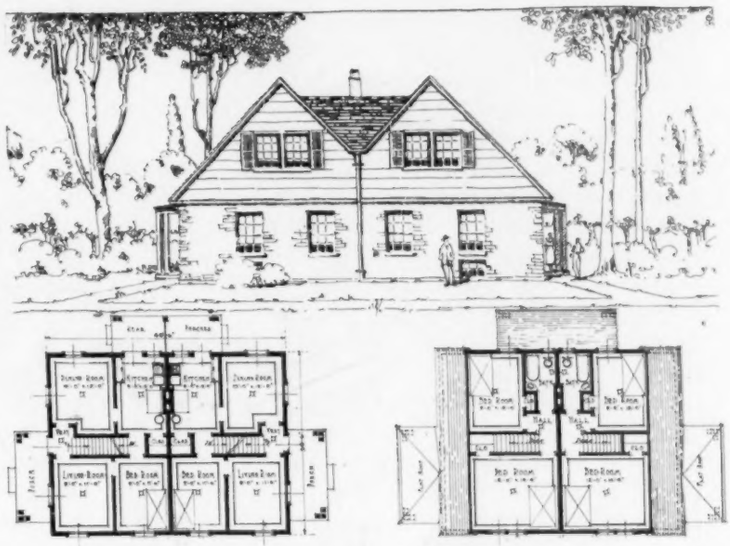


Floor Plans of House Below

Two Houses at Indian Hill, Development of the Norton Grinding Company, Worcester, Mass.
Grosvenor Atterbury, Architect

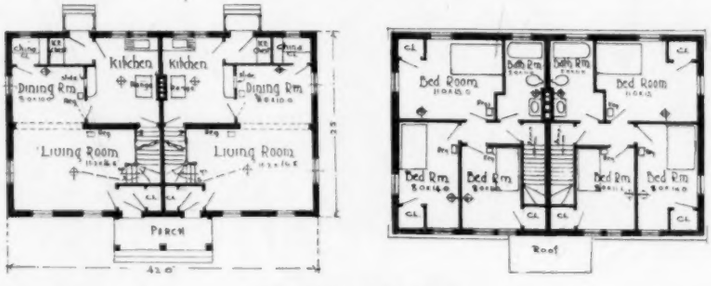
of ample proportions. When eating takes place in a separate dining room, when washing consumes a smaller proportion of the housewife's time, the kitchen is used more nearly for its primary purpose and may be correspondingly cut down in size.

If we could always assume an intelligent use of space provided, the English arrangement would be most acceptable. We should have a small scullery — we might probably call it a kitchenette — in which would go on all the cooking and dish-washing, and nothing more. The large living room would then have one end dedicated to dining, and such a room would be really utilized through all hours of the day. It is an excellent arrangement, and it would work well — if the workman would so use it. But as yet the craving for a "best parlor" has not died in his breast. For the present the scullery, with living-dining room combination, will appeal far more strongly to the higher grade mechanic or clerk with small family than to the majority of workmen with larger families and greater kitchen activities.



Semi-Detached House Built in Syracuse, N. Y., 1917
Cost about $3,000 per family. Tile and frame construction. Cellar and heat
Mann & MacNeille, Architects

Another feature which is somewhat affected by nationality, but is a pretty general requirement for all classes of workers, is the rear entry. A laborer or a miner, just so soon as ideas of decent living standards are adopted in his household, loses the privilege of entering the house proper, even the kitchen, direct from his work. The rear entry is his first stop, and there he must have hanging space for the grimiest of his working outer garments, before going inside to "wash up."



First and Second Floor Plans

Semi-Detached House for Highland Road Land Trust, Brookline, Mass.
Brick walls, slate roof, cellar, and hot air heat. Cost in 1916 about $3,000 per family
Kilham & Hopkins, Architects

The house must, in the second place, be suitable for the locality. Obviously the housing problem in a copper mining town of New Mexico is a far cry from that of a New England munitions town. This affects, in every particular, the matter of construction, with which we are not primarily concerned now, but it affects also the type, size, and shape of the house. Where land cost is low, where the amount of winter heat required is at a minimum, it is as cheap or cheaper and perfectly practical to omit cellars, to spread out over the ground, putting a four-, five-, or six-room house all on the one floor. In a northern climate the discomfort and heating cost of such a type would render it quite out of the question. Similar considerations affect the matter of roof slopes, eave projections, etc.

The workman's house must, furthermore, be suitable in size for its purpose. There is a growing conviction that the general average of low-cost houses are too large rather than too small. Superfluous space always suggests a boarder to occupy it. Heretofore no general attempt has been made in planning the

house to make proper provision for the boarder, with the result that his presence has invariably tended toward lowering standards of household living. Mr. Ham, of the Bridgeport Housing Company, advocates making it possible for the worker's house to grow up with him as his family and presumably his income increase. This he would do, not by building successive additions to the original house, but by providing houses of graded sizes, with a larger proportion of small ones (that is, of five rooms or less) than is usual at present, and by making it easy for a man to change his holding as the need arises.

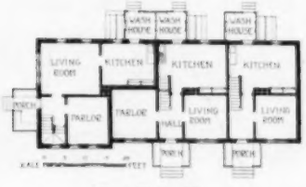
The Bridgeport Housing Company has done this very thing, at least so far as the provision of the several sizes is concerned, in their Connecticut avenue group, where the range reaches a minimum size apartment of two rooms. These occur in a low, two-story group. In their future enterprises, however, they will probably include very few, perhaps, none, of these two-room units. The tendency is to attract the floaters, who move in and out at no notice, cause damage and depreciation to the property, and prove generally undesirable; while the young married couples, or the older ones without children, take more kindly to the three- or four-room units.

For the single family detached house the four-room unit comes near to being the irreducible minimum. And here, speaking always of the family group with children of both sexes, the rooms should be arranged as one large living-kitchen and three bedrooms. The program lends itself to good architectural treatment for conditions where one-story houses are advisable; it is, of course, very difficult, architecturally, where two of the bedrooms must be on a second floor.

The five-room house is the first grade where size and arrangement give some degree of latitude in planning. Accepting for the normal family the three-bedroom requirement, puts the sleeping rooms in a majority over the living, and this seems unavoidable unless the boys may be permitted to sleep in a transformable day room. When we advance to the six- and seven-room houses, we enter the range of actual

Exterior View of Three-Family House

Second Floor Plan



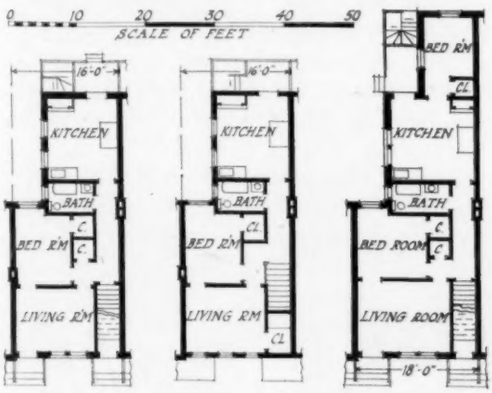
First Floor Plan

THESE houses were erected in a development of 105 houses for the Pittsburgh Reduction Company at Massena, N. Y., during 1907. Basements have 10-inch concrete walls, upper walls of 9-inch common red brick furred. Second story walls on some houses of frame, sheathed, papered, and covered with stained cypress shingles. Trim of cypress painted. Roofs covered with cedar shingles dipped in stain. Interior finish of cypress stained. Floors of hard pine. Cost about $2,000 per family.

Exterior and Plans of Four-Family House

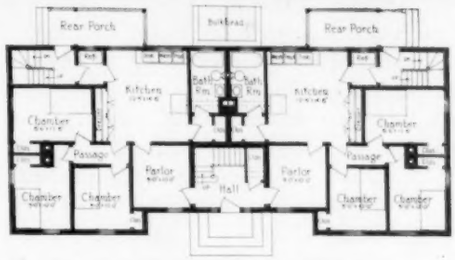
Albert H. Spahr, Architect

architectural planning, with a multitude of given conditions and requirements, which, taken with the economic side of the case, challenge the most skilful designing. Up to the present there has developed a wide variety of plan and arrangement, but some few features are common to the best of them. The all-inclusive requirement of simplicity is one that must apply to every detail: to the shape of the building (for a given area, the square has the least exterior wall); to framing of beams and rafters; to layout of partitions — the least possible number of breaks and jogs; to disposition of plumbing, so that the piping may be most direct and shortest; to the stairway, that the run may be easy to frame and put together (a straight run



First and second floor plans of three-room flats at left
Cost $2,250 per family
Four-room flat at right. Cost $3,000 per family

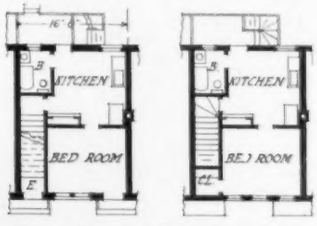
CONSTRUCTION of stucco on frame, slate roof. Division and stairway walls of brick. Built 1915 and cost $1,970 per family, or 13 cents per cubic foot. Both floor plans alike.



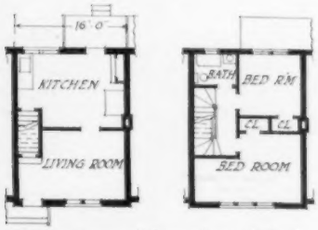
Four-Family House for Naumkeag Steam Cotton Co., Salem, Mass.
Kilham & Hopkins, Architects

is of course the cheapest); to hall spaces, that they may be so small as to be economical, but not so cramped as to be a nuisance and a damage; to closets, that they may be properly placed in relation to the rooms they serve, and of a shape to give maximum service in minimum space.

The greatest variation among low-cost cottages exists in the placing of the stairway. Probably a majority put it along one side of the living room on an outside wall. This is often a pleasant feature in a room which tends to be featureless, but



First and second floor plans of two-room flats. Cost $1,500 per family



First and second floor plans of single house in blocks costing $3,250

General View of Houses in the Connecticut Development, Bridgeport, Conn. Schenk & Mead, Architects
Erected in 1917 at average cost of about 30 cents per cubic foot

it has disadvantages: the room requires more heat, and is always subject to drafts; it makes the living room a passageway, and in the case of a boarder, usually involves giving him one of the family rooms. The next most frequent placing of the stair is in a little entrance hall at one side of the house, with access to living room at the other side. This results, in houses of three living rooms, in an impression of ample scale, because the rooms may be thrown wide open into each other and count at their biggest. On the other hand, these stairs occupy one of the good corner exposures of the house, thereby preventing its use by a bedroom. This exposure is sometimes stolen back by gaining a high silled, recessed window in the bedroom above, in as wide an alcove as head room on the stairs will permit.

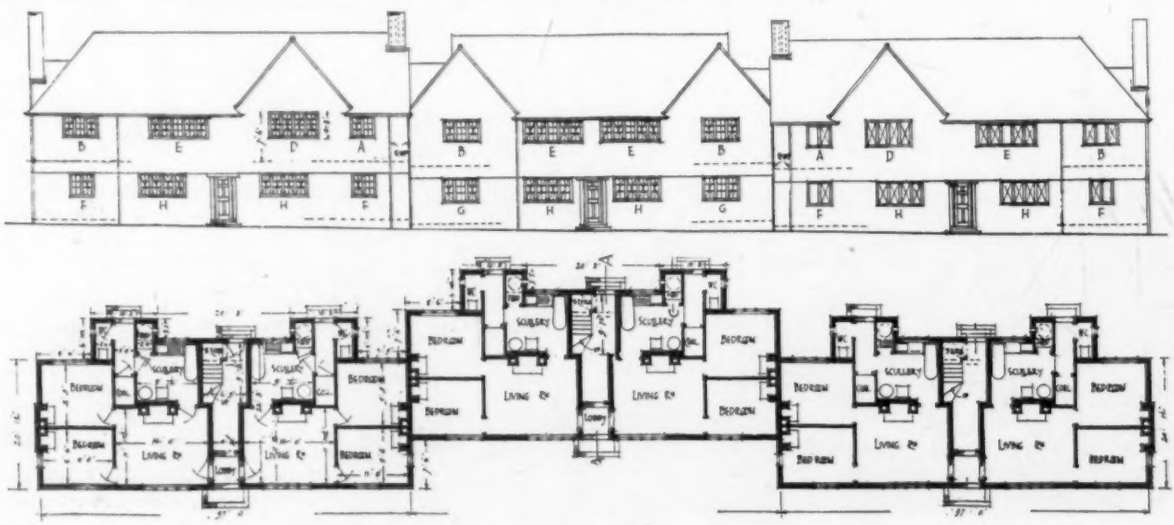
If we are willing to accept the small house as a small house, and not try to magnify its apparent size by throwing its first floor all together, the central stairway has decided advantages. It gives a minimum first floor hall, openings to living-dining room at one side, to parlor (or bedroom) at the other, and a straight run of stairs. Its economy of hallway is at a maximum in the house of only two bedrooms on the second floor. There the hall at the top is like that below, with merely turning space into the bedrooms and bath.

For the semi-detached house, most of the accepted types are derived more or less directly from corresponding grades of detached house. There are, however, several points at which the existence of the party wall raises special points. If houses are for rent only, it is desirable to concentrate plumbing into one stack for the two houses; it is well to get stairs next the division line where light is least, thereby saving the good exterior corners for living quarters; it gives better privacy to keep living porches away from the party line, so that each family may have opportunity to live unto itself insofar as it wishes to do so.

The semi-detached house is, in most cases, superior from the housing standpoint to the two-family house — from the architectural standpoint, vastly so. The lessened sense of privacy, the usual difficulties of access and responsibility, are compensated only by the most exceptional circumstances and the most careful planning.

The group house, or terrace type, is becoming more nearly standardized than any of the others. It is generally agreed that such houses, with light and air confined to two sides, should not be more than two rooms deep. Anything more results in the pocketing of the interior room, and shutting off cross-drafts from the others. Here again the stair arrangement is the crux of the planning problem. A very compact and economical plan is that in which stairs go up directly from the main entrance, with a parlor-bedroom at the side and a single room, the living-kitchen, at the rear. Upstairs is equally direct and simple. The difficulty seems to lie in the use made of the downstairs front room. If as a parlor, well and good; but if as a bedroom, the necessity of passing through it to get to the kitchen from upstairs is a serious defect.

Another type places the stairs in the center of the house, running crosswise. This has the advantage of not requiring much framing of beams, and it gives the front bedroom of the second floor the benefit of the entire width of the house. On the other hand, to get the separate access to the living-kitchen, there must be a hall leading back to it the full depth of the front room. While on plan this appears a waste of space, every one must realize the necessity, even in the minimum sized house, of a certain amount of hanging space for coats, etc., which will be so used, in any event, in the rooms themselves if no other space is available.



Plans and Elevation of Flat Building Accommodating Twelve Families
British Government Housing Development at Well Hall, England

Jefferson Rouge, the Development of Solvay Process Company, Detroit, Mich.

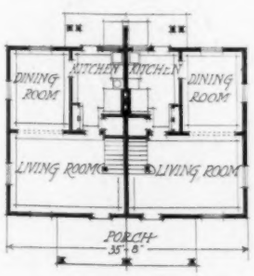
MANN & MacNEILLE, ARCHITECTS AND TOWN PLANNERS

THE housing development of the Solvay Process Company is especially interesting in showing to what extent the proper subdivision of land is essential to the success of a housing enterprise. The land on which these houses have been erected borders the river Rouge and is about two miles from the center of Detroit. The growth of Detroit in manufactures has been so great in recent years that all land possible of development for this purpose is held at a high figure. In the present instance houses for the workers of the Solvay Company were badly needed, but in the plotting of the land nothing better than $1,000 per lot had been obtained, which was, of course, excessive, and the whole project was in danger of being entirely abandoned.

General Plan of Jefferson Rouge Development

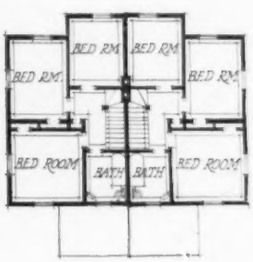
When Mann & MacNeille were engaged to study the problem, they first took into consideration the future growth of Detroit and apportioned streets which would be continuations of Detroit's main thoroughfares. The land abutting these streets was then reserved for commercial development and a corresponding value placed upon it. This reduced the cost of the remaining land to the equitable basis of $300 per lot, and the development was then carried out in accordance with the plans reproduced herewith, a large portion of which is completed.

In the construction of the houses the architects were able to take advantage of an existing contract the Company had for building brick which was not further required for its original purpose, and a system of brick veneer



First Floor Plan

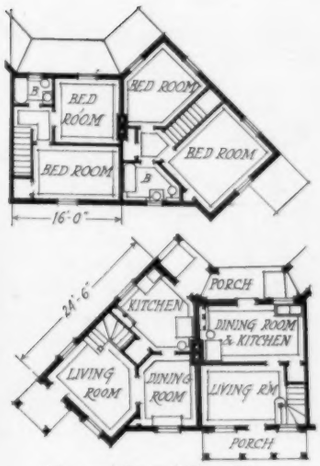
Two-Family House, Costing $2,700 per Family



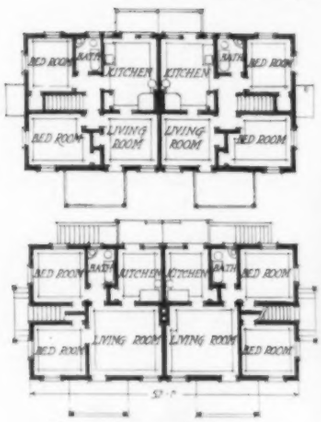
Second Floor Plan

General View of Henley Street Looking toward Blackburn Street

Three-Family House on Dorset Street, Costing $2,400 per Family



First and Second Floor Plans of Three-Family House

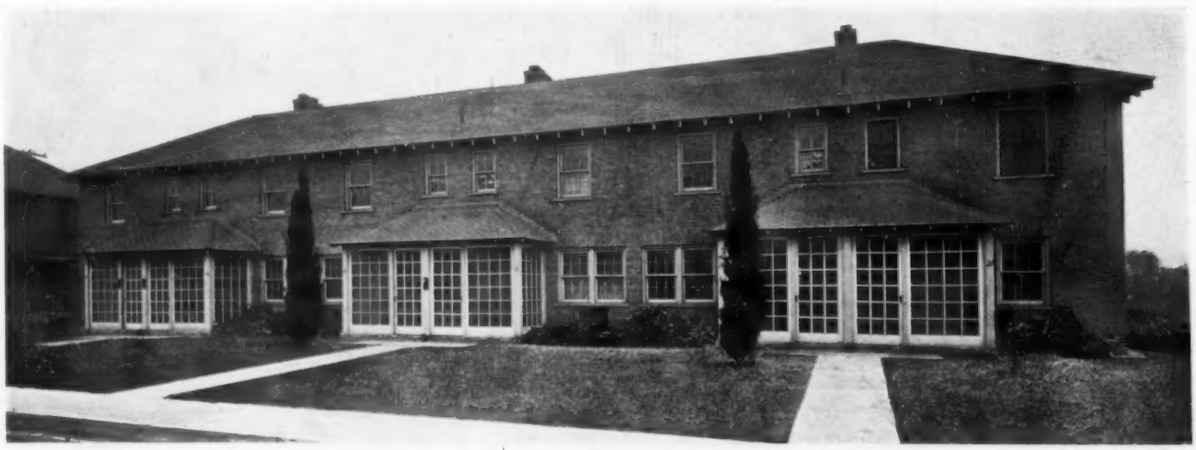


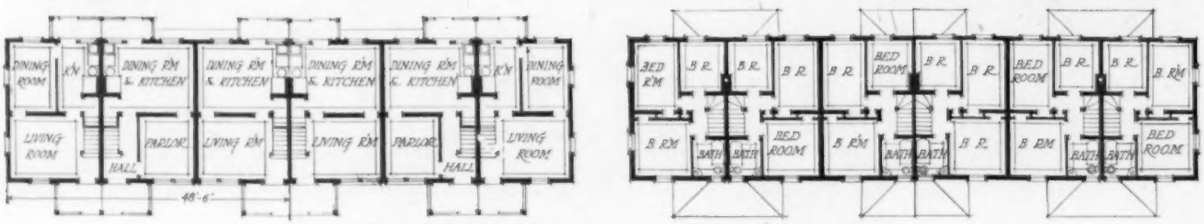
First and Second Floor Plans of Four-Family House

Four-Family House, Costing $1,875 per Family

on frame was adopted as the most economical form of construction under the special circumstances. For variety of treatment, stucco on wire lath was introduced and a dull red asphalt shingle was used for all roofs, thereby welding the whole into a harmonious composition but sacrificing nothing in interest or variety of effect.

The development is characterized by group houses

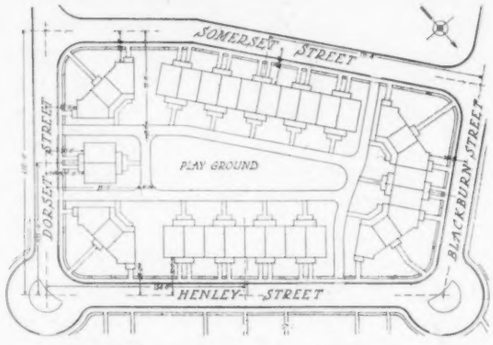




Floor Plans and Exterior of Six-Family House, Costing $2,400 per Family

General View of Central Block from Corner of Blackburn and Somerset Streets

instead of single dwellings, the family units ranging from four to six rooms in size and from $1,875 to $2,700 in cost. All houses are provided with cellars and a heating system, bathroom, and sink with hot water boiler in kitchen. The houses of the central block, between Henley and Somerset streets, follow modern English precedent in their architectural treatment and show a pleasing grouping about an interior playground. They have been placed low on the ground to give them a comfortable, homelike appearance, and the consequent difficulty of admitting sufficient light to the cellars has been solved in a novel manner. The cellar windows have been placed directly under those of the first floor, and a bulkhead, serving the purpose of a window seat, built into the first floor rooms, permits the light to enter the cellar. This scheme is less expensive than outside areaways, which are generally used under similar circumstances, and also eliminates the difficulty always attendant with their proper maintenance.



Plan of Block between Henley and Somerset Streets

Two boarding houses operated by families and each accommodating fourteen single workers are another unit of the development. They are located at each end of Henley street, frontage on the circular parked spaces.

Although a very economical use of land is evident from a study of the plan, the care expended in the placing of the houses, with varying set backs, and the special grouping at the intersections of streets have contributed a sense of spaciousness to the entire development, and with the completion of the planting program, the village will have many picturesque and attractive qualities.

View of Model of Block between Henley and Somerset Streets Showing Interior Court

Methods of Economy in Housing Construction

By CHARLES A. WHITTEMORE

IN considering the question of economy as applied to the housing problem, we are likely to lead ourselves into the common error of thinking that economy means the "least possible amount" as referred to expenditures. To any one who gives this subject careful consideration, the fallacy of such an idea must be apparent. True economy and false economy are as far apart as the poles. Unless we get the correct viewpoint, our whole discussion is likely to be distorted.

Economy in house building comprises various elements. Not cheap, shoddy construction whose life may be but a span of years. Not the cheap tar paper, shingle covered, temporary construction. Economy means low cost for materials of real value, with construction methods as good as may be; omission of unnecessary elements and luxuries and simplification of all possible processes.

Even though we are not now considering the phase of "economy" as applied in the psychological sense, we must here record the fact that there is no real economy in building a cheap shack, glossed over with a superficial dressing of shingles, clapboards or the like, and presented to a workman for his family to occupy at a price at which some real construction might be obtained.

Nor must we lose sight of the fact that the evolution of labor is not complete. The cycle is but partly rounded. The effect on labor of the shoddy houses, their attitude toward an employer who rents them such an apology for a home and who, rather than help them improve their condition, offers them accommodations no better than the slums they know so well, must be most carefully worked out. The immigrants of yesterday may be skilled labor of to-morrow.

There are so many phases of the housing problem that one can only express ignorance of it all in claiming a complete solution. England spent time and money in solving it; the United States may profit by England's experience, although the conditions are so radically different. Up to the present the housing efforts may appear to have been conducted on the principle of "grab it all and get something done," rather than "offer the best solution."

A broad, general, comprehensive plan should be adopted and the Government developments made along these lines. Once this has been established and the right type of development determined for each locality — Macon, Ga., does not require the same type as Erie, Pa. — the question of real economy is encountered.

For the purpose of this discussion we will assume the type selected to be the proper type for the place, and that all the details of the development which do not enter into the actual construction are happily arranged.

One of the first considerations is the magnitude of the operations. None will question the greater economy in a large building project of say one thousand houses over a development of only two hundred. In the interest of this greater economy the Government plans should be so laid that the houses be built in as large numbers in one contract as possible. Not that the numbers should be carried beyond or even quite up to the actual demand, but rather that the housing groups in territory as nearly contiguous as possible should be under one general constructive control. The net saving to the Government, if such a method were adopted, would be large and would offset some of the expenditures in other directions which may seem unnecessarily extravagant.

In carrying on the development of one of these groups, an efficient organization is a vital necessity. No house can be built as a single, separate unit without the skeleton of an organization, and the functions of the unit are manifolded in the group. The organization may be called upon to purchase, sell, lease, mortgage land, buildings, real estate, etc.; may loan money, build roads, sewers, streets, etc.; may develop all the functions of a municipality and still be in the pursuit of economy in the general development. Such an organization must comprise many divisions and branches, and each of importance. Not the least of these would be the material purchasing department and the contracting and building department. On these two actually must rest the return on the investment. In their control lies the possibility of gain or loss from the standard of maximum economy. They must, therefore, be carefully selected and efficiently managed. If the development be large in scope and number of buildings, the purchasing becomes more nearly a wholesale rather than a retail function. It might even be more economical to purchase standing timber instead of builders' finish. The extent of the possibilities in the direction of purchasing is limited only by the magnitude of the operation.

It will at once be recognized that the purchasing department must be guided by some other influence than the cost of each grade of material. Oak finish might be offered at a low, attractive figure, but might not be economical in the general construction. Pine may be quoted at such a price that when bought in quantities oak, ash, or chestnut may be not only better but also cheaper. These conditions must be determined by the contracting department

under the guidance of the general planning head, and thus does the organization build itself.

As has been noted, the careful selection of materials is of utmost necessity in order to construct houses such as should be built for the workmen at the various ship-building and munitions plants in the most economical manner. Careful selection does not, necessarily, mean selection of the grades of materials, so much as it refers to the kind of material which is most easily available in large quantities and which can be produced and delivered with the least possible delay. In this item again the purchasing department of the organization plays a great part, but before this matter reaches the stage of the purchasing department it must be very carefully investigated in laying out the original work. For example, in some localities stone is easily available for foundation work; while cement means additional transportation and, under the present conditions, the transportation problem is in such shape, that this factor should be eliminated in so far as possible. Stone, if available, can easily be hauled over the road by teams; while cement invariably means not only car-load but train-load lots if the development is of any magnitude.

So it is, also, with the roof materials, with the outside finish, and with the outside structural materials. Brick makes an excellent outside wall, either used structurally or as a veneer on a wood frame. It has this advantage over almost any other material,—that the low priced bricks can be made to present a pleasing appearance and, once laid, the maintenance cost is at an end. Other materials, such as stucco or wood, require more or less attention. In this particular instance the first cost is not necessarily the item to be the most seriously considered.

The materials having been carefully selected, the next important step in securing the best results from the standpoint of economical construction is in the nature of standardization of materials and details. It is not necessary, nor is it advisable, nor would it make a good development, to have all units exactly alike. A change of units can readily be effected without militating against the standardization of materials. In one development, for instance, there may be but two sizes of floor timbers used, these two sizes being of different lengths. The mill getting out this lumber could get them out in the exact lengths, and thus eliminate much of the hand work at the building. With an arrangement of this kind the rooms which would be of the same size in many units may be placed in different relative positions, and each house still have a very satisfactory plan.

The doors and windows can all be of standard form, detail, and size, so that one mill order put through in large quantities would produce the material for a very large operation. The classification of the materials at the building would be very much facilitated because all of the units, being of the same size and interchangeable, would require less scheduling and arrangement on the lot. So it is with the inside finish, which can be of a standard detail and yet varied in a large degree in its arrangement.

The flooring, the kitchen and closet fittings, the outside trim, fireplaces (where such occur)—all of these can be standardized, so that the same materials and the same sizes can be used in all different parts of the building development and eliminate a large amount of mill work. This same thing is true of all the different elements which enter into the house, such as the ranges, the plumbing fixtures, the piping, electric fixtures, hardware, etc. It is obvious that purchasing the same type and style of a commodity in large quantities possesses a great advantage over purchasing the same quantities of different types.

After the standardization of the materials has been effected, so far as the plans are concerned, a vital necessity is the elimination of useless and unnecessary rooms. In a private residence for an owner, when the residence is built as a unit by itself, many features which may be classed as luxuries can be added which, while not absolutely necessary, make toward the more pleasurable enjoyment of the residence as a dwelling place. Because these units are not essential, they may easily be eliminated in a development which is purely commercial and which is to provide houses for a class of workmen who have not previously been accustomed to the comforts and conveniences which even such a type of development will offer.

An architect frequently finds in laying out a private residence odd corners which are called storage closets or by some other name, but it must be a matter of careful study in the planning of housing developments to eliminate all odd corners and to make every inch of space in the house available for the actual living necessities. This, of course, will tend to reduce the size of the house and to eliminate some of the expense of the building.

Instead of kitchen pantries and butler's pantry and rear entrance, etc., arrangement can easily be made to accommodate all the materials usually served by these rooms in another way, without necessarily increasing the size of the house. For example, the kitchen walls may be built with cupboards, similar to what is known in the profession as a "Dutch kitchen." These cupboards do not take up valuable space and in many cases utilize space which otherwise would be wasted. So it is with linen closets and cold closets in the basement, etc. It may be of psychological value to allow the man who occupies one of these houses to build his own storage closets, creating a more personal interest in the house by the labor of his own hands. The unnecessary rooms and

unnecessary closets and storage places count a great deal in the reduction of the cost of building.

The heating, plumbing, and electric systems may be laid out on a very economical basis, or may be extravagant without being any more efficient. This requires careful investigation in order to determine the most economical layout of these various functions. In some cases it may be wiser to use the hot air type of heating system rather than steam or hot water. Location, weather conditions, climate — all have an important bearing on this work. In the colder sections of the country steam may be used, while in more temperate localities a furnace may answer all needs.

In laying out the heating system, effort should be made to use as few chimneys as possible. If two houses are built side by side with a single wall between, — the type known as "semi-detached," — the chimneys may be built in this wall, and one chimney used not only to serve the heating plant, but also the kitchen stove in each house.

There also comes to mind the question of a central heating system, whereby one plant would distribute the heat to various buildings. This, of course, is desirable and economical where houses are built in blocks, and may even be desirable in the case of detached dwellings. The increased cost of laying pipes in the streets and underground to the buildings, as well as the heat loss due to imperfect insulation, and the fact that a flaw in the heating plant would inconvenience so many tenants, is likely to make it not so available in the cases of single dwelling units as in other types of development.

There are in existence now in some cities central heating plants which supply heat over a radius of miles, and in some cases these are economical as an investment, but, undoubtedly, the merit of an installation of this kind is in the magnitude of its operation, and would not necessarily be available where the heat demand is small.

The plumbing system should be of the simplest type, but should be complete. In some housing developments the lavatory, usually placed in the bathroom, is omitted, and the occupants wash at the kitchen sinks. In the judgment of many who have studied this problem this is a case of first cost economy which does not prove wise. The people who occupy, or are likely to occupy, houses built under the program now in consideration are people who may not have been accustomed to the same type of living conveniences as those who now occupy a relatively higher station in life. They should, however, have an opportunity to acquire the better methods of living, and this can be afforded them without a prohibitive increase in the cost of the house development.

In installing the electric system three-way switches should be entirely eliminated, as the convenience of this construction is greatly overestimated, and the cost does not warrant such an installation in any economical plan. The usual heating plugs and receptacles may also be eliminated, because the majority of the workmen not only do not understand, but probably would not require, devices of this sort. Where receptacles can be installed without any additional cost beyond the cost of the box and cover itself, it may be advisable to place one or two of these in convenient places in the house, but such installation would not be advisable if it means additional running of wires.

The simplification of all of the elements entering into house construction should be the uppermost thought in the mind of those who are making the development layout. Standardization alone cannot accomplish as much as may be required, while standardization accompanied by simplification will undoubtedly produce results which are eminently desirable.

It may be advisable in some instances where the development will warrant to use floors of fire resisting material such as concrete; to use plaster which will not readily deteriorate or dent — such as the patent hard plasters. The use of these materials immediately permits of the adaptation of the hard plaster, etc., to the jambs and trim around doors and windows. The concrete may also be carried up to form the base around the room. Where concrete floors are used, however, there must be some other surface for a walking surface, and in this case wood or linoleum can be readily adapted.

There is a type of floor construction on the market which is not only economical, but which has all the merits of concrete construction, together with the peculiar characteristic of being of great tenacity in holding nails. A wooden floor may be laid directly on this material without the use of sleepers. The expense of this is very slightly more than the cost of wooden construction, and it presents a possibility of plastering directly on the under surface, eliminating furring and lathing, as well as the nailing strips for the upper floors. Materials of this kind should be carefully investigated and, undoubtedly, many adaptations of structural materials not now considered in the plane of economical construction may be used to advantage.

Inasmuch as the class of occupants in these houses, as a rule, will be those who have been more accustomed to the tenement house and less desirable living conditions, it is advisable to eliminate to as great an extent as possible all interior and exterior woodwork which can readily be damaged. Not that the occupants will not take so great care of the materials, but that the children, not being accustomed to conditions in which they now find themselves, are likely to be less easily controlled and, inadvertently, to introduce a maintenance cost factor which will work

against the development as an investment. In a recent development in the Middle West some very nice, artistic houses were constructed and rented to workmen, but, after having been occupied about a month or two, the piazza railings and wooden steps had entirely disappeared. To a large degree this wood may have been used for fuel, but certainly, to some extent, the carelessness of the children caused damage. Metal finish for bases and trim can be easily acquired and is now being seriously considered for these developments. These metals are not easily dented or injured in other ways, and a little paint can readily repair the damage and make the finish as good as new.

The economical construction of houses in such a development does not end with the careful selection and standardization of materials, nor with the consideration of the various details and elimination of the unnecessary features. This forms only the first step, and when the construction work is commenced, a very great factor for waste enters in. The actual construction work must be intelligently laid out, so that there will be no lost motion and no waste effort. As an illustration, consider a development on both sides of a single street, which we will assume to be large enough to accommodate say one hundred houses. If the work is carefully laid out, the excavation will be started at one end of the street and carried to the other limit as rapidly as possible. As soon as one excavation has been completed the foundation work will follow and be carried through to the limit of the development. With the completion of the foundation of one house, the carpentry, framing, etc., will start in and follow through. By the time the masons have completed the last foundation work, the first house will be ready for plaster and chimneys. It will be seen that in this way a smaller crew of men may be maintained on a development, and will accomplish, with systematic employment of labor, as great results in a given space of time as though a much larger force were employed with less intelligent direction.

There are, undoubtedly, a great variety of ways in which the work may be laid out differently from the example cited that may produce as efficient results, but it is obvious that the minimum number of workmen must be employed commensurate with economy of operation, and necessary to the elimination of waste effort or loss of time. This can be effected only by a very careful plan. A large corporation carrying on work of this sort would have differently organized "gangs" of men for each part of the work, and these men would proceed with their respective functions in one portion of the development, pass on until the whole work is completed, and then on to a new location, and, in this way, become so thoroughly accustomed to the type of work and the best manner of executing it that there would be considerable saving of time and effort in the final result. Intelligent planning of labor, as well as intelligent planning of material, must be a large factor in the house development.

In any organization for handling workmen of such a character as is here being considered, it is vitally essential that there should be close, intimate co-operation between the contractor, the laboring men, and the material man. A particular effort should be made to maintain an equitable, harmonious arrangement in all these branches of the work. The tendency of the times under existing high costs is to make the labor element somewhat restive, and any dissatisfaction on the part of the laboring man necessarily will produce results which are not of the character to be desired in the finished work. Every effort should be made, therefore, to see that the laboring men in connection with these developments are properly paid, are well cared for as regards their own living accommodations during the construction, and that the surroundings and employees in other branches of labor may be made as harmonious as possible.

The magnitude of the operation enters vitally into the cost, as it is obvious that the greater the number of duplicated units the less will be the individual expense. There is, however, an economical limit where this may not hold true. Such a limit would be in the instance of one organization handling large developments of, say, one thousand houses, in various locations at the same time. Here the increased cost of shipment to the various localities of the different items entering into the construction might operate seriously against the lower cost for each locality, were it being constructed as a unit by itself.

It may not be inappropriate to call attention to various forms of contracts which are being considered in operations of this character. The "cost plus" type of contract is being superseded, to a large degree, by types of contract which are more favorable to the speedy, economical completion of the work, without a possibility of friction between the owner and the contractor.

In the "cost plus" system by itself there is no limit to the expense, and this fact is reflected through all of the various sub-contracts. It is undoubtedly true that the present high prices of materials are directly due to a large extent to the existence of "cost plus" contracts.

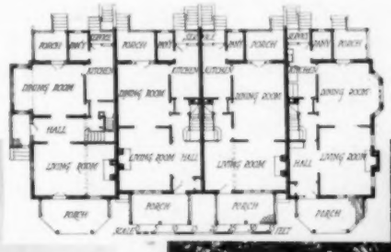
A better form of contract is one where the cost of the operation is established; where the contractor is given a fixed profit, plus a proportion, say one-third, of the net savings he may make below the contracted amount. This form of contract has operated very satisfactorily in private professional practice, and has the advantage of giving the contractor an additional incentive in that, as the cost of the work decreases, his remuneration increases.

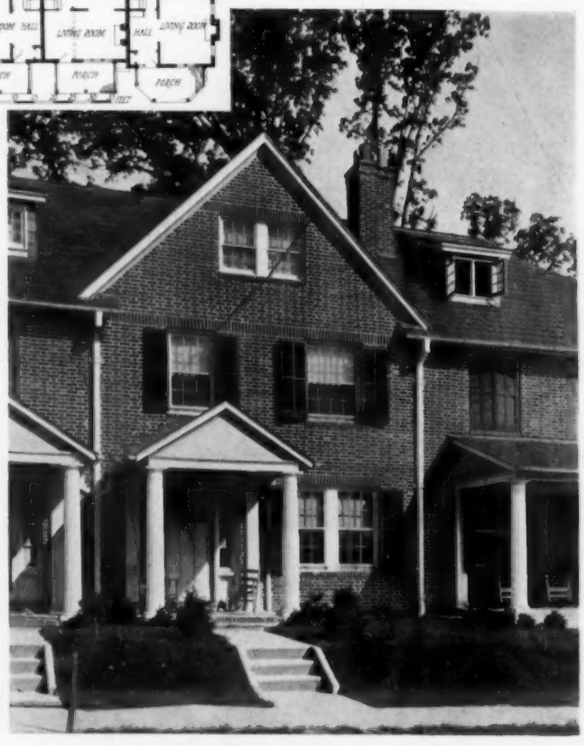
Another form is a contract in which the construction price is established and the contractor allowed a certain percentage. If the cost exceeds the contracted price, the profit to the contractor is reduced by a fixed proportion. If, on the other hand, the cost is less than the contracted price, the profit to the contractor is proportionately increased. The only disadvantage of this latter type lies in the fact that no special provision is made for extra work which was not contemplated at the time of the contract; while in the "cost plus" type and in the "first cost plus percentage" type this contingency is well cared for.

The net result of the tremendous housing operations which are now, or soon will be, in full swing will undoubtedly be a readjustment of prices for labor and material, and a rearrangement of contract forms which will do away with the old gamble which contractors are called upon to assume. No contractor estimating work hurriedly, and particularly without very keen competition, will put in the contract prices which do not include a safe allowance for possible contingencies which may arise. The newer forms of contract eliminate the necessity for this gamble on the part of contractors submitting bids.

In this whole housing problem one thing of extreme importance which must be kept in mind is that the development should be arranged so as to be a permanent addition, if possible, to the locality in which it takes place. To do this, the houses must be made of a sound, reasonable construction and character, and provisions must be made to render the developments sufficiently attractive as to warrant a permanent investment for the laboring man. Primarily these developments are undertaken with the idea that the laboring man will purchase his own home and become a citizen of the community in which his work is located. It must also be borne in mind that as civilization progresses, the laboring class are being educated to a point far beyond that which they previously enjoyed, and a development of this sort must not in the least degree tend to reproduce the living conditions to which the laboring man was formerly accustomed. The psychological effect of making the laboring man feel that he is an essential part of the community in which he lives, and that he is wanted rather than despised, will go far toward making a stable, economical building and manufacturing condition in the country which no other course could possibly produce.

First Floor Plan at Right of a Group of Four Houses





Two Detail Views Showing Different Exterior Treatment. Group of Houses at Oakenshawe, Baltimore, Md.

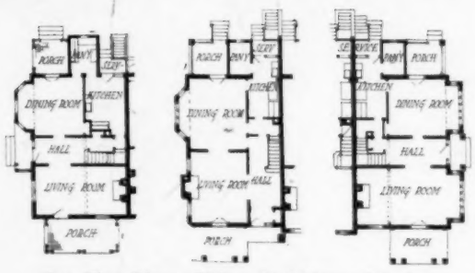
Flournoy & Flournoy, Architects

Group of Houses at Oakenshawe, Baltimore, Md.

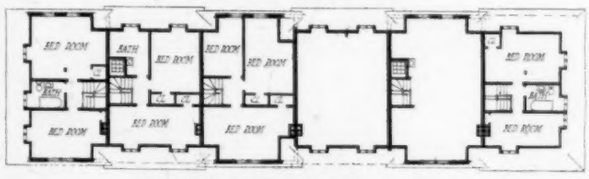
FLOURNOY & FLOURNOY, ARCHITECTS

THESE houses occupy both sides of Guilford Terrace in Guilford, the later development of Roland Park in Baltimore. They are built in five groups,—three containing six houses each, one containing four, and another five. They are 21½ and 22 feet wide, and the lots are 100 to 105 feet deep. The walls are of dark red brick, relieved by occasional stuccoed bay windows, white porches, cornices, etc. The roofs are surfaced with bluish gray slate, laid 8½ inches to the weather. Porch floors are of red quarry tile with brick borders. The interior finish is yellow pine, generally painted white. Interior doors are birch or fir with mahogany finish.

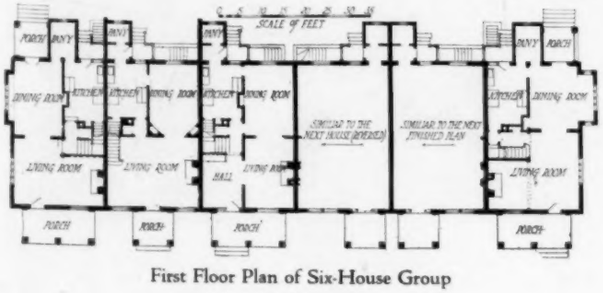
The architects endeavored, as far as was consistent with economy, to obtain as much variety as possible in the design of the houses in both exterior appearance and arrangement of rooms, there being but few duplicate plans in any one group. Although these houses were built for sale, the construction and finish are decidedly superior to the average house of this type, and the cost was less than might have been expected. The large groups, erected in 1916, averaged 15½ cts. per cubic foot, and the others, built in 1917, 17½ cts.



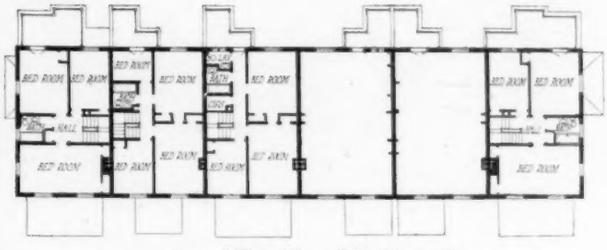
First Floor Plans of Three End Houses Showing Variations in Treatment



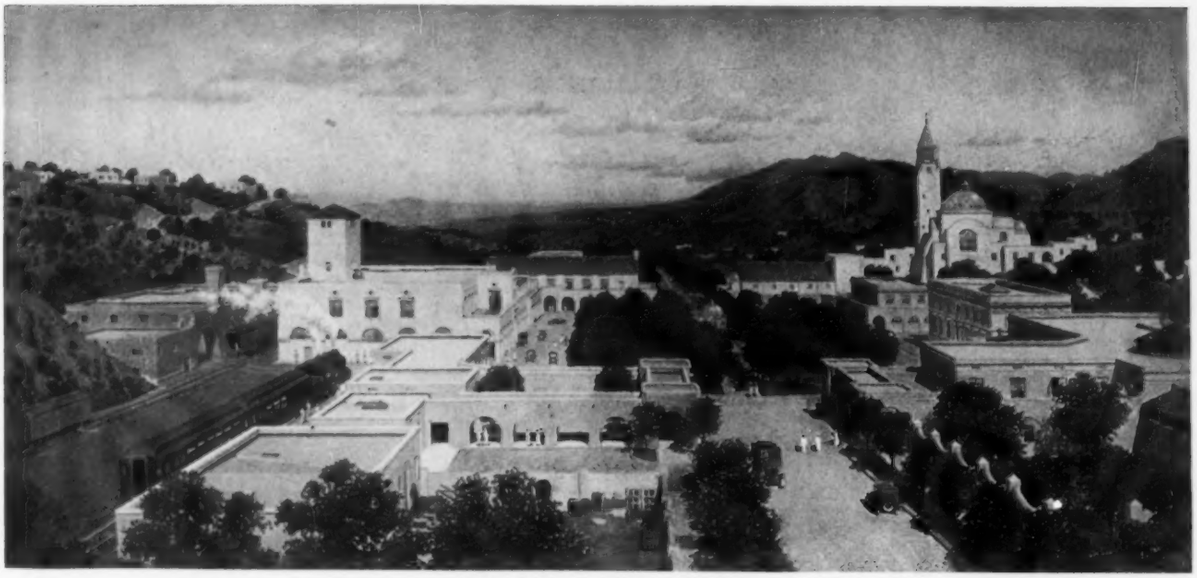
Third Floor Plan of Six-House Group



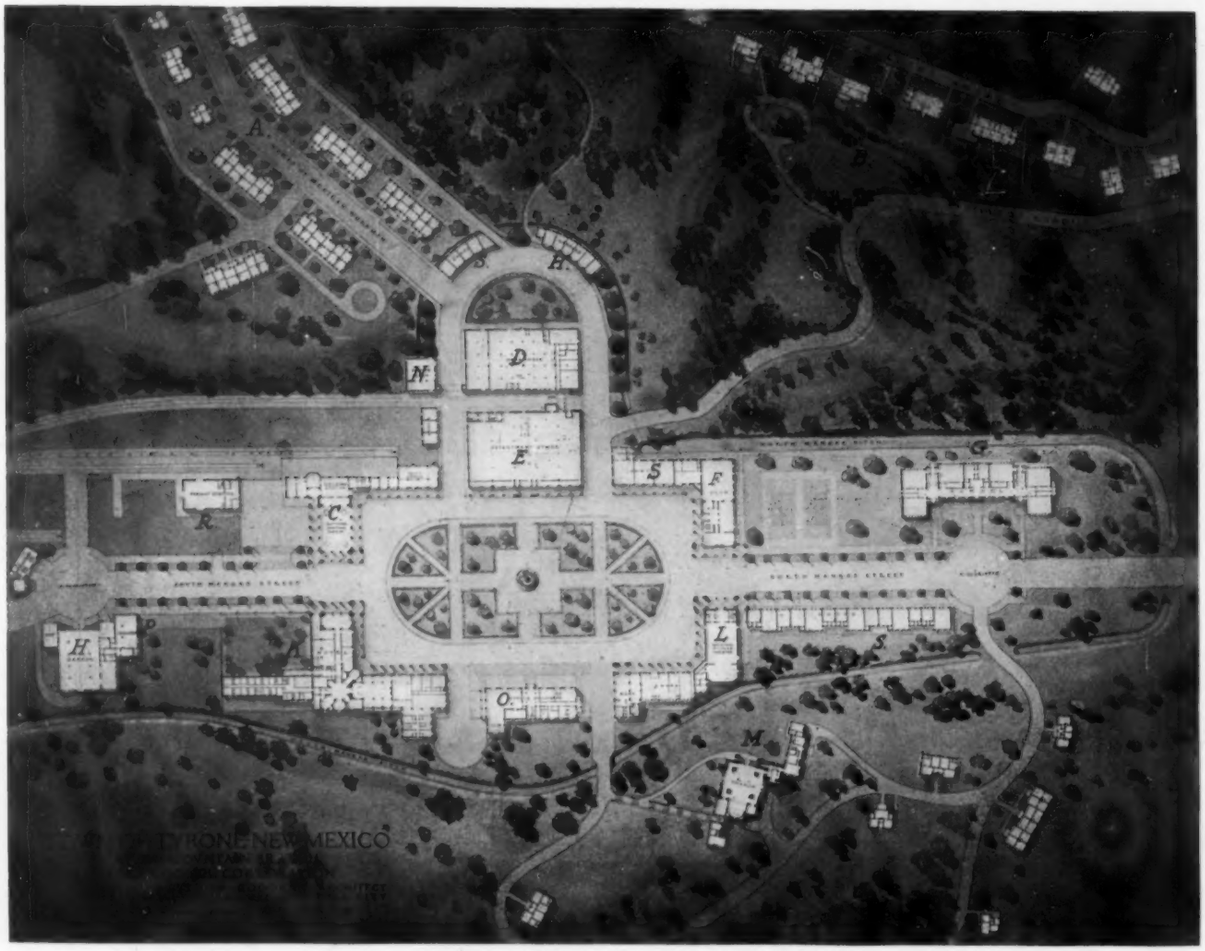
First Floor Plan of Six-House Group



Second Floor Plan of Six-House Group



Perspective View of Town Center



A Mexican Houses
B American Houses
C Railroad Station
D Warehouse
E Department Store
F Club
G School
H Garage
K Hotel
L Theater
M R. C. Church
N Heating Plant
O Offices
P Saloon
R Freight
S Shops

TYRONE, NEW MEXICO, DEVELOPMENT OF PHELPS-DODGE CORPORATION

Bertram Grosvenor Goodhue, Architect and Town Planner

Tyrone, New Mexico, the Development of Phelps-Dodge Corporation

BERTRAM GROSVENOR GOODHUE, ARCHITECT AND TOWN PLANNER

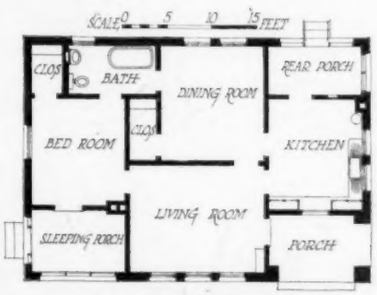
AT Tyrone, in southwestern New Mexico, the Phelps-Dodge Corporation is building an industrial development which is entitled in several respects to the overworked adjective "unique." In the first place, its character is most unusual for an industrial village as pictured east of the Mississippi — the flat roofed, Spanish mission type of architecture is foreign and likewise not suited to eastern and northern conditions; second, in its reliance for effect upon rough textures, broad surfaces, an entire absence of applied ornament, and especially upon abundant use of integral color, it stands quite alone; third, its method of procedure is different. Ordinarily, the company puts up groups of houses, larger or smaller as the case may be, and follows, usually with some tardiness, by supplying the more general community needs. In this case the two classes of building have gone on simultaneously.

The development at Tyrone is a fiat city just as truly as was Gary—the classic example of American city building. And it is by no means in criticism of the company to say that their provision of community buildings was forced upon them by circumstances, for there was nothing whatever of the sort when the building program was entered upon, and we know that even a copper-mining town must have its nucleus of municipal activities. It was, therefore, virtually a clean slate which was handed to Mr. B. G. Goodhue of New York, on which he was to trace the outlines both of town-planning and of housing.

The site for the town is a rarely beautiful one in a valley between mountain ranges, about a mile and a quarter from the mine. A railway terminal brings the passenger directly to the village center, the mail to the receiving platform of the postoffice, and freight to the doors of the warehouse.

Around the rest of the perimeter of the village square, at present about half of them built, are the department store, hotel, office building, bank, moving picture theater, a number of shops, and a clubhouse. This club, by the way, is to be run on a basis of pure democracy, its facilities open alike to the American engineer and the Mexican miner. The hotel, it should be said, is projected to accommodate, not so much the transient public as the resident bachelor, and its planning is particularly to suit his needs. On a rising ground outside the center is a large schoolhouse. Its furnishings were supplied by the township, of which Tyrone is a part; but like all the other buildings for community use, except the railway station, it was built by the company itself. Buildings such as the shops and the bank are leased to individuals or companies for operation. The company activities, not stopping here, include also a plant for generation of electricity, and a central heating plant which will take care of the buildings about the central square as well as some few outside.

Of the town-planning features of the project it is not here possible to speak; that must be reserved for separate treatment. At the moment we may merely call attention to some of the points of interest in the matter of housing. The dwellings divide themselves naturally into two main classes, — those for Americans and those for Mexicans, the nationality from which practically all the common labor is drawn. For the Americans, the accommodations are much the same as those to which the East is accustomed, except that only one house, that of the mine superintendent, has a heating plant aside from stoves and the kitchen range, and except that all the houses have but one floor. Plumbing is a complete installation, with sewer connections; electric lighting is everywhere provided. Many of the house plans show the convertible room feature — that is, a large living-dining room, with a smaller room which may be a dining room or may be rented out to a lodger without prejudice to the privacy of the family itself.

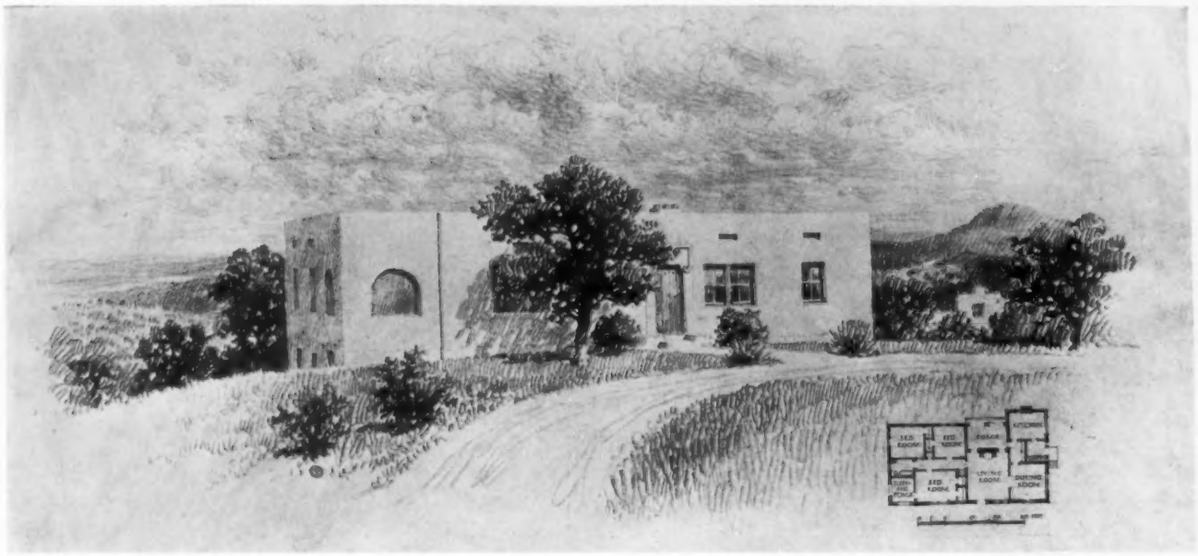


Floor Plan of Houses Below

Another feature which verges upon

American Detached House, Type O2

American Detached House, Type O



COST OF AMERICAN HOUSES (FIRST SERIES)

Type	Cubical Contents	Contractor's Estimate	Wiring and Fixtures	Fence	Hardware	Extras	Total	Cost per Cu. Ft.
B	18706	$2642.00	$67.80	$50.00	$18.00	$25.00	$2802.80	14.9
L	17481	2469.70	78.70	80.00	25.00	25.00	2678.40	15.3
M	23897	3434.20	88.60	80.00	25.00	25.00	3652.80	15.2
N	22423	2894.80	79.70	80.00	25.00	100.00	3179.50	14.1
O1	15501	2378.60	64.40	50.00	15.00	25.00	2533.00	16.3
O2	15501	2392.20	64.40	50.00	15.00	25.00	2546.60	16.4
P	13926	2001.80	57.65	50.00	14.00	25.00	2148.45	15.4
R	15439	2201.40	76.55	50.00	15.00	25.00	2367.95	15.3
R1	15887	2268.20	76.55	50.00	15.00	25.00	2434.75	15.3

Total number of houses 15
Total number of families 20
Cost of 15 houses $40,608.05
Appropriation $40,650.00
Average price per cu. ft. 15.2
Houses completed March, 1916

COST OF AMERICAN HOUSES (SECOND SERIES)

Type	Cubical Contents (feet)	Contractor's Estimate	Electric Fixtures	Fence	Hardware	Extras	Total	Cost per Cu. Ft.
S1	16121	$2556.35	$50.00	$65.00	$18.45	$26.00	$2715.80	16.9
S2	17456	3111.90	50.00	65.00	18.45	32.00	3277.35	18.8
SS	34500	6119.80	100.00	130.00	36.90	63.00	6449.70	18.6
U	16573	2604.45	50.00	65.00	18.45	27.00	2764.90	16.6
V	54326	8970.95	150.00	160.00	55.35	83.00	9419.30	17.3
W1	33207	5550.25	100.00	120.00	36.90	55.00	5862.15	17.6
W2	33207	5550.25	100.00	120.00	36.90	55.00	5862.15	17.6
X1	19155	3049.75	60.00	65.00	22.15	33.00	3229.90	16.8
X2	19155	3017.25	60.00	65.00	22.15	33.00	3229.90	16.8
Z	16530	2647.90	50.00	65.00	18.45	27.00	2808.35	16.9

Total cost of 15 houses for 20 families $60,417.45
Average price per cu. ft. 17.3
Houses completed March, 1917

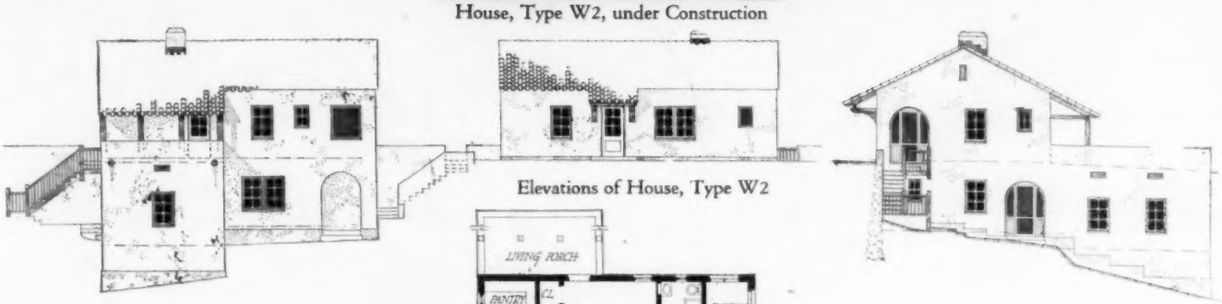
SKETCHES FOR AMERICAN HOUSES, TYRONE, NEW MEXICO

Bertram Grosvenor Goodhue
Architect and Town Planner

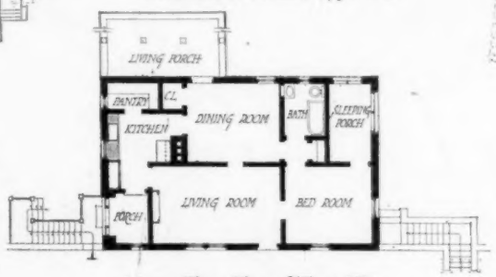
James Perry Wilson
Delineator

the "unique" is the manner in which a virtue has been made of necessity in adapting the house plans to the excessive grades of the side hill where they must be placed. The solution is made possible because these houses are, as we have noted, confined to one floor. On some of these slopes a normal house placed in its natural relation to the street level at the front has necessarily such high foundations at the rear as to give a perfectly well lighted and ventilated space adequate for another family. And so they have been built. The sole practical disadvantage in the lower level entrance is the loss of the one exposure where the structure beds itself into the hillside.

House, Type W2, under Construction



Elevations of House, Type W2



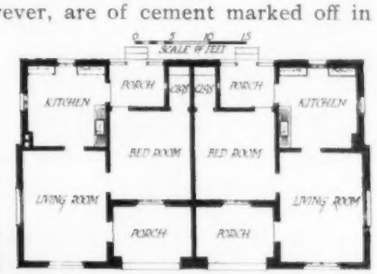
Upper Floor Plan of Type W2

The houses are further interesting from the structural standpoint. All exterior walls are stucco, most of them on terra cotta block, though recently trials have been made with an adobe brick which promises well economically. Interior plaster is directly on the blocks, the waterproofing being applied as an integral part of the stucco. The same is true of the color — that is, the third coat of stucco contains the color as part of its own mixture. Interior finish is everywhere flat and simple. Roofs, where flat, are 3-ply asbestos, laid in tar; where sloping, which is the case only where accents of brighter roof color were needed, they are of tile which was brought east from California.

The houses for Mexicans, as indicated by the plans reproduced, are smaller and more compacted than those for the Americans. They are not as yet provided with sewer connection, nor have they the bathroom facilities of the larger houses. For the rest, they are of the same substantial construction and the same rough breadth of finish. Their floors, however, are of cement marked off in

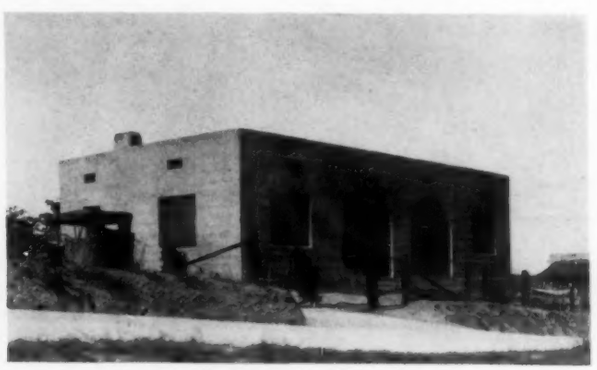
Floor Plan of House, Type M2

Lower Floor Plan of Type W2



Floor Plan of House, Type N1

American Semi-Detached House, Type M2



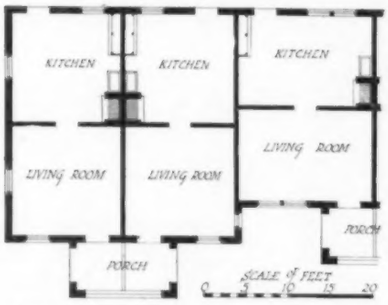
American Semi-Detached House, Type N1

large squares and finished at the walls with a low cement wainscot instead of the hard pine which is used throughout the American houses. The porch floors in all the houses are likewise of cement. The ceiling heights in general are 9 feet in the clear, and air spaces with vents opening in the outside walls are provided beneath the roofs for ventilation.

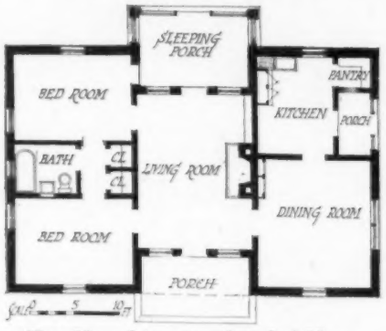
The particular charm of these houses is their suitability to the country in which they are located. Their broad stucco surfaces, on which there is a refreshing absence of effort to secure even planes and rigid angles, are extremely restful in the brilliant light. The simple exterior details and arched openings furnish strong shadows, giving the necessary points of accent. The color is intensified here and there by projecting porch roofs and hoods surfaced with red tile and supported by corbels and beams of rough hewn timbers. The windows, which are of the casement type throughout, add another feature of interest. Planting which will tie these houses to their sloping sites remains to be done, but sufficient development has already taken place to indicate the picturesque character that will eventually be attained. The site of the town is one of great natural beauty, and the architect in his disposition of the community features on the lower level and the residential streets on the hillsides above has neglected none of the opportunities it afforded.

As in other developments, the Tyrone colony has been building against a rising market. The two schedules reproduced show very strikingly the conditions of 1916 as compared with those of 1917. They contain, too, significant data for prophecy concerning the current year and the difficulties to be met by the Phelps-Dodge Corporation. It is to be hoped that it may be found possible to carry on an ambitious program auspiciously begun, in spite of the handicap of rising costs, for a development of the complete character of Tyrone is sorely needed in America to emphasize the value of well ordered, town-planning principles in industrial communities.

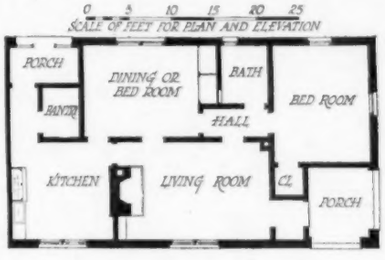
Type X2 under Construction



One-Half Floor Plan of Group of Six Mexican Houses

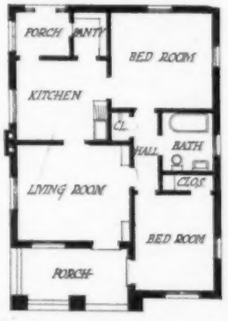


Floor Plan of American Detached House, Type X2



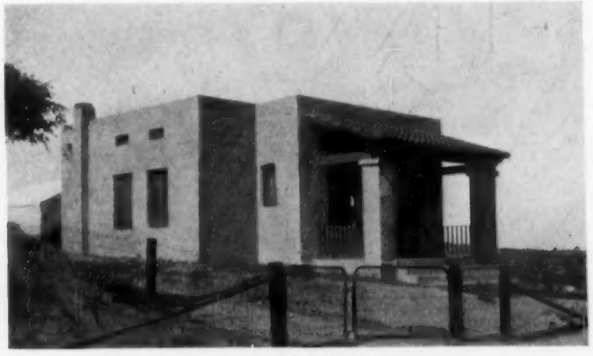
One-Half Floor Plan of Semi-Detached House, Type SS

Rear Elevation of American Semi-Detached House, Type SS



Plan of House, Type R1

American Detached House, Type R1



American Detached House, Type P2

The Financial Aspect of Industrial Housing

By C. STANLEY TAYLOR

NOT only in written expositions of the various phases of industrial housing, but in their discussion by civic bodies and by individual manufacturers, the most carefully avoided subject has been the difficult question of financing. Writers have side-stepped this important issue because of a lack of definite knowledge, or the means of gaining that knowledge. Manufacturers have generally avoided it because to them its consideration has offered but one solution — to provide the money as part of the plant investment, and this the stockholders have been unwilling to do. Bankers, having given cursory analysis, have passed it by, classing it as risky and unattractive collateral. Perhaps this has been a just decision, when we consider the spirit of *laissez faire* which has characterized the housing of American workmen in every stage of our industrial development.

In all the years since the establishment of great manufacturing industries at strategical geographical points has brought about a centralization of industrial workers, the human machinery of industry — labor — has been neglected. With a few striking exceptions, the energy and capital of industry have been directed toward a perfecting of inanimate machinery and sales efficiency. The master hand controlling the law of supply and demand has been that of the financier and organizer, and the strength of that hand has always been dependent upon its ability to temper the wind of supply to the shorn lamb of demand. Just so long as potential supply in our commercial markets exceeded demand could the balance of power be retained by capital.

During the time when supply exceeded demand, the factor of production played a minor part in the great game of industry. But labor has been inherently an integral part of production, bearing no tangible relationship to finance. Thus, with the balance of power in the hands of financiers, whose interest was not in production, it has been but natural that labor should align itself against capital.

What labor wanted — reasonable hours, better pay — it obtained only through organized resistance and insistence. Ultimately, then, better housing for industrial workers must have waited through the years for the demand of organized labor, had it not been for the sudden industrial upheaval resulting from the unnatural demand of a world war. To-day the law of supply and demand lies shattered at the feet of war emergency. Production, and not demand, is the word of the hour. Thus labor has become a supreme need.

As before stated, the problems of most manufacturers are no longer those of selling. Their entire energy is now directed toward increased production — the betterment of their animate machinery has become a definite object. Labor turnover, being far above normal, is a subject of grave concern, bringing in its wake the wastes of "breaking in" new hands, mechanical depreciation, and lowered plant efficiency. The difficulty is not so much in getting labor as it is in holding labor. To the manufacturing plant comes the greatly needed mechanic, until the number of employees has been doubled and redoubled, and all available local housing has been exhausted. Transportation means are overburdened, the workman has difficulty in finding a home for himself or his family, and he naturally drifts on to another plant. Thus the percentage of "floaters" is greatly increased through the lack of housing.

Almost over night the need for industrial housing has made itself felt to such an extent that it has become a national issue. Congress has for some time been considering the question of Government aid for the housing of workers at shipyards and munition plants. Already $50,000,000 has been appropriated for housing at shipyards, and at this writing a bill is in committee appropriating another $50,000,000 for housing at war *matériel* manufacturing plants.

At this time, when the financing of industrial housing is being considered on a large scale, it seems logical that manufacturers and bankers should give careful study to the subject of seeking a means through which an elastic system of real estate credit for this purpose may be established. Through logical economic reasoning we have established the soundness of industrial housing as a greatly needed investment. Production is the need of the hour, and will continue to be the need for many years to come. Labor is the need of production, and proper housing is the need of labor and the means of holding it.

What other argument is needed to establish in the minds of the community, the manufacturer, and the banker the soundness of this collateral? Is not the indirect return on this investment of such incalculable value that it merits a place as part of plant investment, and is not plant investment the basis for a vast total of money loans?

In Great Britain the affirmative answer has taken form in an expenditure by the Government of $700,000,000 in one year to house the workmen. In addition to this amount many millions of private capital have been wisely invested in this manner. This is the message from across the seas, and in considering the financial aspect in industrial housing we cannot well overlook it.

The next question, and one which bears directly upon the financial success of a housing investment, is that of the wise expenditure of this money. During the years before the war, when little attention was given to this subject, the speculative builder reaped a golden harvest. Into our community life, through his unrestricted building activities, he thrust the ugly eyesores which to-day constitute our tenement and slum sections. Utterly devoid of architectural merit, insanitary, poorly constructed, the average housing of our industrial classes stands as a mute testimonial to our monumental folly in allowing the speculative builder to spend annually at least 20 per cent of our national industrial payroll. He has betrayed his trust, and the day of fire-trap, health menacing, and heterogeneous home-building is drawing rapidly to a close.

To make the investment in industrial housing one having financial, as well as social and æsthetic merit, the housing expert is being called in — the doctor of homes, if you will — to diagnose and prescribe in order that we may establish a proper precedent for the years to come, and create the basis of a sound investment. Thus the financial value of the service of an architect, who is at once a town planner and a student of social and labor conditions, is definitely established.

* * * * * * *

At the present time, owing to the high cost of building material and labor, together with rapidly increasing land values around most industrial centers, it is impossible to make a definite statement of the direct financial return which may be expected from an investment in housing. At the recent One-Day Conference on War Housing held under the direction of the National Housing Association at Philadelphia, the statement was made by a representative of shipyard labor that the workman could afford to pay up to 22 per cent of his monthly income as rent. Using this logical figure, the best we can do is to analyze present-day costs, relating them to the income of the average workman in order to gain some idea of what might be expected in the way of direct financial return.

Under present conditions it is extremely doubtful whether a 5 per cent return could be realized on a rental basis if the income is to be limited to 22 per cent of wages. In practically every case the types of labor which it is necessary to house are skilled labor and mechanics. In general, the industries which are to-day in great need of housing do not employ a large percentage of common labor. The presence of gang labor engaged in yard and building improvement is usually for a period of a few months only, and the housing of this labor is of the bunk-house and barrack type of temporary nature.

In the matter of permanent housing, therefore, we have usually to consider no lower class than that of the skilled laborer and the mechanic. These men are earning at least $20 per week in almost every case. Considering this as a minimum, we have an annual income which will allow them to spend approximately $220 per year on rent.

In order to determine the gross income necessary to provide 5 per cent earnings on capital investment, we find that general experience has shown that this should be at least 10 per cent. With the minimum present-day consideration, a rental of $220 per year, we have available for investment $2,200 to pay the cost of the cheapest houses which we may consider building, together with the costs of land, street improvements, recreation grounds, etc. After deducting from $2,200 the cost of land, improvements, expert architectural and engineering advice, we have usually insufficient money to construct a suitable house at the present scale of building material costs.

But is there not another way in which this matter may be handled and a sound investment provided for the mutual benefit of manufacturer, workman, and banker?

We have already referred to the indirect return which the manufacturer enjoys through the stabilization of labor, resulting from the provision of proper industrial housing. What is this worth to the manufacturer? Surely it is fair that he should bear the cost of recreation centers, expert advice, general improvements to the property, and even the cost of land. This is a small investment for which to obtain a well housed working force, and in the course of a very few years the savings which would be realized on overhead expense of the factory would not only pay a high rate of interest, but would cause a return of the principal.

With these costs assumed by the manufacturer, taking his return through saving in his own plant, the success of the investment in the construction of houses would not only be assured, but the project would be easy to finance. In addition to this, employees would be encouraged to buy their homes, and the attractive selling prices and rentals would serve as the best form of labor insurance.

The individual banker or loaning institution does not usually profit directly by the greater stability of labor and the increased efficiency resulting from proper housing. This profit comes directly to the manufacturer, and for this reason loaning institutions cannot reasonably be expected to require less conservative security than is now the custom in building operations. These institutions have always to consider that the demand for housing may fall off with production demand. In view of this fact no better guarantee can be offered by the manufacturer, who above all others is to profit by the operation, than his direct assumption of a part of the financial responsibility. In addition to this, when application is made for an industrial housing loan,

ment plan to place at his disposal a house which he

There is left for discussion only the question of the

much depends upon the care with which the plan has been worked out and upon its presentation.

The question is often brought up as to whether labor unions will interfere with the purchase of homes by workmen. It is naturally assumed that they would because the purchase of homes renders labor less flexible. A deeper analysis of this subject might, however, show little loss of flexibility because workmen's homes are not usually provided except in industrial centers where available housing has been used up. These industrial centers include many manufacturing units, and a man is not usually dependent upon one job for a living, as he could undoubtedly find work elsewhere in the community. It might, therefore, be more fair to state that organized labor would object to the workman purchasing his home in a "one-industry community." On the other hand, it would probably be found that in the average one-industry community the policy of the owning company would be to maintain control through renting instead of selling. Above all, we must consider the home-owning instinct which is born in every man, and which recks not of the wishes or prejudices of the labor union or of the manufacturer. If he is given an opportunity to do so, a man will always buy his home if working conditions and community life are satisfactory to him. What he wants is comfortable living, sure pay, educational and community facilities.

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Realizing that the provision of industrial housing is of great economic importance and exercises a beneficial influence upon industry (which, after all, is the basic collateral of all loans), it behooves bankers and loaning institutions to give careful study to the question of providing the money for the large investments required. It must be realized that industrial housing constitutes a permanent investment; and that where it does not constitute a permanent investment —in other words, where it is certain that the demand for housing will fall off—buildings of a temporary or portable nature only should be provided. Such projects are not expected to interest loaning institutions, their attention being directed only to the financing of permanent housing.

Since we are asking the workman himself to assume ultimately the cost of his house, either through direct purchase or through the payment of sufficient rental to write off depreciation, we must realize that the usual short term, real estate loan is not sufficient. This, then, is the banker's problem. Interested in maintaining industry upon the highest possible financial plane, he must devise a more elastic system of real estate financing. This would involve the policies of long term loans, reasonable interest rates, and amortization, thus enabling the workman to bear lightly the burden of the roof over his head. To this might be added the encouragement and further development of building loan associations, and for this purpose municipalities and even states might render invaluable aid by the securing of popular support for a proper housing propaganda. Thrift should be made the national watchword, and thrift is ever conducive to home-building and home-owning.

* * * * * * *

In considering financial methods of operation, we are limited to generalities by the active factor of existing conditions in each individual case. There are, however, three distinct methods of operation, each of which has special merits for individual application, and each of which has proven successful in some cases. These are:

1. The housing company organized by manufacturers or other community interests, but operating independently.

2. The copartnership scheme, such as has been successful in England, in which the workman does not buy his home, but buys shares in a co-operative company which owns and operates the industrial village.

3. The paternalistic method, such as that of the great community of Port Sunlight established by Lever Brothers in England. In this general method the employer provides and operates the village for the benefit of employees.

Considering the first operating method, the most obvious fact is that usually there must be a definite profit, the cost of which will be borne by the workman. Such an organization is that of the Bridgeport Housing Company, which buys land, builds and sells, or rents homes. This is an excellent method, provided it does not degenerate into a purely speculative venture which can be avoided by the maintenance of control by manufacturers who are most directly interested in the housing of employees.

A company of this kind is usually financed by a group of manufacturers who hold the controlling stock interest. Enough capital is provided for organization and to furnish the equity for the first operation. After that the business is carried on in the regular manner of an operating real estate and building company, arrangements being made with loaning institutions to provide building and permanent loans. Houses are sold on easy payment plans and rented where deemed advisable.

The second operating method, that of copartnership, is one which is not well understood in this country. It is, however, logical to believe that it will come into vogue in many places during the next few years. In carrying out this method the first organization is completed by those interested in providing housing. A stock company is formed in which the ownership of all land and buildings is placed, and the person who wishes to live in this community buys sufficient stock on the easy pay-

ment plan to place at his disposal a house which he may select. He does not own either land or house, but he does own the right to occupy the designated land and building. In this manner all increment in land values resulting from the centralization of population accrues to the benefit of stockholders, as well as any income which may be derived through the rental of stores, manufacturing sites, and from other concessions.

This plan has the merits of equality in community profit-sharing and offers a flexibility which cannot be gained in any other manner. If a tenant wishes to move away from the community, his is but a stock-selling proposition; and if the operation is properly managed, the ownership of the stock is so attractive that it can easily be disposed of in the same manner that railroad and mining stocks are handled.

This method will overcome any objection which labor unions may have to the ownership of homes by workmen, as it in no way interferes with the flexibility of labor.

The third method involves a larger, permanent investment and is weak in that it induces a spirit of paternalism which might well be avoided. It is always wise to maintain a separate organization for housing in order that complications may be avoided. The paternalistic idea does not take well with the better class of workmen in this country.

As to methods used in carrying out this scheme of operation, it may be found in modified form at Goodyear Heights, the industrial village of the Goodyear Rubber Company at Akron, Ohio. This operation may prove interesting to those manufacturers who wish to handle the matter directly.

A mortgage loan of approximately 50 per cent of the value of land and houses was obtained at 6 per cent from large Eastern financial interests on a long term basis. The houses were then constructed and sold to employees, subject to the mortgage of the above mentioned financial interests, and no preliminary cash payment was required. The second mortgage for the balance of purchase price is carried by the Goodyear Company at 6 per cent interest and semi-monthly payments are made by the purchaser. These are applied to both second and first mortgage, so that the second mortgage is paid off in twelve years and the first mortgage in three years more. The purchaser can make extra payments to reduce the maximum period of payment, and those made during the first five years are on the basis of the real estate value of the property, which is determined by adding 25 per cent to the actual cost. This method is adopted to prevent speculation and after an employee has lived in his house for a period of five years, and shown his willingness to maintain his interest, the additional payments are credited to him.

There is left for discussion only the question of the relative advantages of renting or selling company-built houses. The Dupont interests do not in any case sell a company house, preferring to retain absolute control. This means a permanent investment which many concerns would find it difficult to carry, but it has the value of a constantly available housing supply. Generally speaking, the easy payment selling plan seems to produce the most favorable results in stabilizing labor.

In selling homes to workmen they should be given every possible advantage to purchase economically. The terms of sale should be made easy, extending over a long period, and selling arrangements should in no manner be complicated. They should be easily and thoroughly understood. The confusion resulting from details such as interest, taxes, insurance, and payments on principal should be avoided by working out stipulated regular sums, payable in the same manner as rent. In addition to this it is well to provide some form of insurance which will protect the interests of the worker in case of sickness, death, or a slack working period.

Below are given two selling plans adopted by manufacturers that have proven successful in practice.

SCOVILL MANUFACTURING COMPANY, WATERBURY, CONN.

PAYMENT PLAN FOR $2,750 HOUSE

Terms:	
Cash	$300.00
1st Mortgage	1,800.00
2d Mortgage	650.00
	$2,750.00
$18 per month, $2 per week saving fund	
1st Year:	
Interest on 1st Mortgage at 5%	90.00
Interest on 2d Mortgage at 5%	32.50
Taxes	35.00
Water Rent	10.00
Insurance	2.00
Total Yearly Expense	$169.50
Yearly Rental	216.00
Saving Fund	104.00
Income	$320.00
Expenses	169.50
Net Saving	$150.50
2d Mortgage	650.00
Payment	150.50
Balance Due on 2d Mortgage at End of First Year,	$499.50

At this rate of payment the second mortgage is paid up in two years and nine months. There then remains the first mortgage of $1,800, which may be handled in the usual manner and entailing an expense of $137 per year, or $11.42 per month, representing $47 for taxes, water, and insurance and $90 for annual interest.

INDIAN HILL COMPANY, WORCESTER, MASS.

This extensive community development plan was inaugurated by the Norton Company and the Norton Grinding Company, both of Worcester, Mass., for the purpose of properly housing their workmen.

Terms: 10% cash, 90% mortgage held by company.

Payments: Regular monthly payments will take care of all expenses such as interest on mortgage, taxes, fire insurance, etc.

$14.10 payment per month on a $2,800 property
$17.20 payment per month on a $3,700 property

It is necessary that the purchaser reduce the mortgage as much as possible during the first twelve years of his ownership.

The company recommends that the purchaser take out five shares in a co-operative bank ($5 payment per month), which at the end of twelve years will be worth $1,000. If this is applied to 90% mortgage, it will reduce it to 60%.

The responsibility of the company here ceases. The owner can secure a first mortgage from a savings bank for 60% at 5% interest, or he may take an additional five shares in a co-operative bank. In the latter case, at the end of the next twelve years, he will be the owner of the property.

The company provides insurance on the lives of the purchasers. In the case of the death of the purchaser, the company will pay the difference between what has been paid on the house and 60% of its value.

Interest on the 90% mortgage held by the company has been calculated roughly and found to be about 3.5%. This figure was arrived at in the following way:

$$\frac{\text{Annual income}}{\text{Total investment}} = \% \text{ gross income,}$$

$14.10 monthly payment, or $169.20 per year, which is about 6% of $2,800. If 6% is the gross income and includes charges for taxes, repairs, etc., which expenses probably amount to about 2.5%, the difference between 6% gross income and 2.5% expenses leaves 3½%.

The question of financing is one which is unpleasantly familiar to the few American housing experts whose activities have extended through the past few years. Manufacturers, Chambers of Commerce, and other interested bodies have called upon them from time to time for lectures, reports, and other constructive advice. These have become enthused, but nothing so dampens enthusiasm as the cold water of financial necessity. Local conditions in various parts of the country have been carefully studied by housing experts, and various projects have been made ready for full fruition — but always, with few exceptions, the money to carry out the project has not materialized.

Those who have had the proper solution of this question at heart have looked forward toward a distant but gradually approaching millennium when friendly co-operation between labor and capital should result in broader industrial achievement. The statement is well worth repeating, that the first factories of the world were in the homes of the people, and to-day production is suffering because the homes have not been kept apace with the factories. As we spend money to house and protect mechanical machinery, are we not under obligation to spend money for the housing and protection of the human machinery, without which the other is useless and cannot even come into being?

Here is food for thought and constructive action on the part of the manufacturer who would cut down his overhead costs and increase his productive capacity; for the banker who would protect production, and for the community which would attract and maintain the payroll disbursement which flows like new blood through its commercial arteries.

It is significant that through information received from the president of one of America's largest title guarantee companies it has been learned that investments in German housing bonds have held their value during the war better than any other type of investment in Germany!

Old Tenants' Hostel, Kennington, London, England
Adshead & Ramsey, Architects

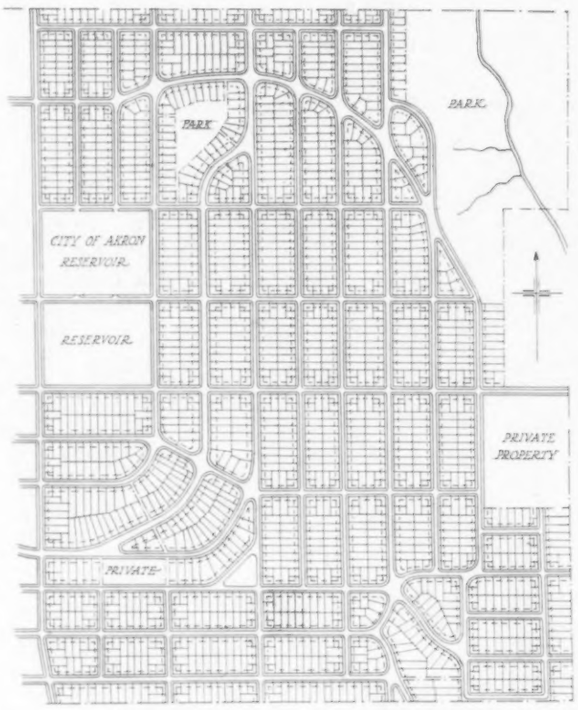
This building is part of a housing development recently carried out in a poor section of London. It contains small apartments of three rooms on each floor and is built about a large, central court from which entrance to the apartments is gained

Goodyear Heights, Akron, Ohio

THE DEVELOPMENT OF THE GOODYEAR TIRE & RUBBER COMPANY

GEORGE H. SCHWAN, ARCHITECT; WARREN H. MANNING, LANDSCAPE DESIGNER

THIS development is the second undertaken by the Goodyear Tire & Rubber Company for the benefit of its employees. It is a continuation of the previous development known as Goodyear Heights and lies along the east side of Brittain Road and adjoins the city reservoir on three sides. The site is approximately one-half mile from the Goodyear factories and two and three-fourths miles from the business center of Akron. Goodyear avenue, which begins at the Goodyear factory and is the principal thoroughfare of the original Goodyear Heights, crosses the new development from north to south. The street railway system will be extended along this avenue, bringing all parts of the property into convenient access with the city of Akron and connecting the two developments.

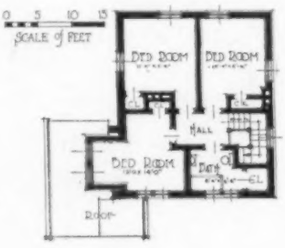


General Plan of Goodyear Heights

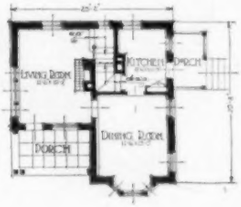
The site comprises about 350 acres and is a rolling tract of land, commanding good views in all directions. Certain parts of the land, notably the southwest portion, are heavily wooded and only sufficient trees for street openings have been removed. All other trees that lend themselves to the development of the plan have been preserved, and before the work is completed all streets will be suitably planted with trees and shrubs.

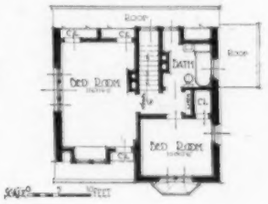
The streets are laid out to conform with the future growth of Akron and are 50 and 60 feet wide, with the exception of Goodyear avenue, which is 70 feet wide. All streets are to be paved and stone curbs and concrete sidewalks will be provided. The blocks have been so arranged as to avoid the use of alleys. The average lot is 50 feet wide and 115 feet deep.

The houses themselves are permanent in character and present a wide diversity of exterior treatment and inge-



THE two houses shown below at the left are of brick construction. The plans of the larger one are opposite at left. It cost $3,860 in March, 1917. The house with plans at the right is constructed of brick on backing-up tile and cost in March, 1917, $3,865.





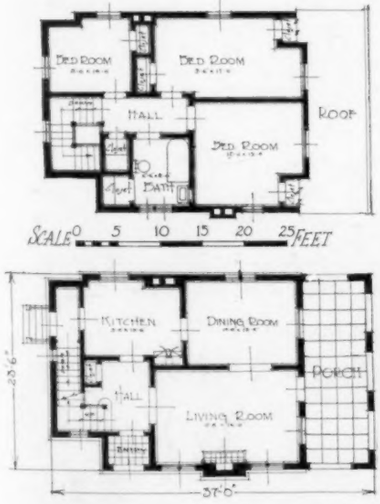
Types of Single Houses at Goodyear Heights with Floor Plans Above

Exterior and Floor Plans of Five-Room House Costing $3,840 (March, 1917)

nuity in planning. They are single, of five and six rooms, and cost from $2,400 to $4,450. The materials of construction are brick on backing-up tile, and stucco on hollow tile. Occasionally the second stories are of shingles to afford variety. The roofs are slate, porch floors of brick and concrete, and other details of similar enduring character to ensure a low maintenance cost. The houses are equipped with hot air heating, sanitary plumbing, and electric lighting systems.

There are 525 houses now under construction. They are sold to employees of the Goodyear Company on a simple and easy payment plan, the large building operations of the Goodyear Heights Realty Company, the organization in charge of the work, making the price to

Two Views Showing Grouping of Houses for Interesting Street Elevations



Exterior and Floor Plans of Six-Room House, Stucco on Hollow Tile, Costing $3,750 (March, 1917)
George H. Schwan, Architect

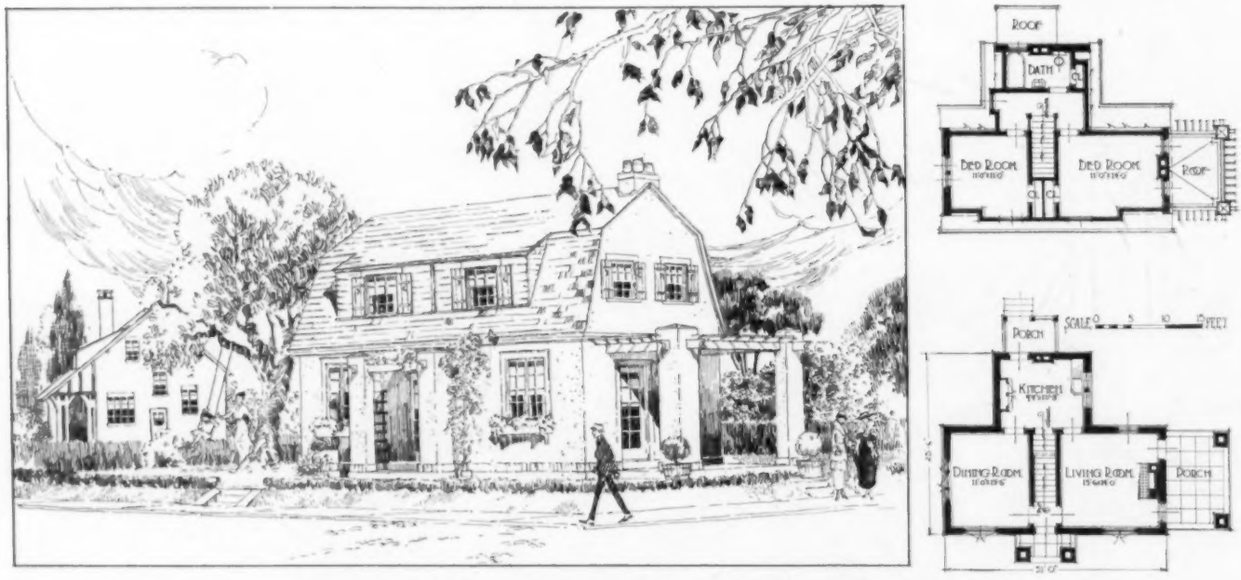
THE house shown in plan at the left is of hollow tile with stucco surface. The illustration shows it incompleted. Its cost in April, 1917, was $3,800. The house at the right is brick on the first story, and frame with shingles on the second. It cost in January, 1917, $3,360.

Two Single Six-Room Houses at Goodyear Heights

the purchaser much lower than if he were to build his home individually. The selling plan is as follows:

Two mortgages may be placed upon a property. The first mortgage is for one-half of the cost value and is carried by the Metropolitan Life Insurance Company of New York, the payments due them being made to the Goodyear Company. A second mortgage is given the Goodyear Company for the balance of the purchase price. A payment of 2 per cent of the purchase price is required at the time of purchase. Semi-monthly payments will pay off the second mortgage in ten years and the first mortgage in ten years more, the rate of interest being 6 per cent per annum.

To discourage speculation, the payments for the first five years are based on the real estate value, which is 25 per cent higher than the cost value; but at the end of the fifth year, if the purchaser is still in the employ of the company, and retains title to the property, the difference between the two values and the interest paid thereon is canceled by crediting his account with that amount. All payments thereafter are made on the basis of the cost price of the property.



Five-Room Single House, Stucco on Hollow Tile, Costing $4,300 (March, 1917)
George H. Schwan, Architect

Broader Economy in the Maintenance of an Industrial Village

By HORACE B. MANN

IN A general analysis of the proper and economical maintenance and management of an industrial housing group the subject naturally divides itself into two aspects for consideration as follows:

(1) Physical maintenance, involving inspections and timely repairs in a constant effort to check depreciation.

(2) The human element in maintenance, taking advantage of deliberately induced psychological reactions and commonizing the interests of tenants and the housing company.

A definite reason to which may be ascribed the failure of many promising housing projects has been the inability or unwillingness of the original owner or developer (usually a manufacturer) to realize the great importance of properly maintaining the community, socially as well as from the purely physical viewpoint.

This general attitude on the part of American manufacturers has in many cases resulted in a termination of direct interest, once the houses were built and tenanted. This has been partially due to their unwillingness to attempt an apparently expensive program of supervision, although in reality if such supervision were placed upon a systematic, commonsense basis, it would repay the cost many times over in the saving on depreciation and mechanical cost, and in maintaining the intrinsic and social value of the community. The problem of maintenance is not a burden to be cast aside, but constitutes the often unrecognized basic factor of the success or failure of the entire project.

Maintenance is not so difficult a problem as it may seem on first approach. It offers as an inducement for its successful solution a fair return on invested money; increased labor efficiency; closer co-operation of employer and employee, and the fostering of proper pride on the part of both in good living and working conditions. This helps to reduce labor turnover and contributes its quota to increased plant efficiency. These are the greater dividends on housing investment, and only through maintenance may they be kept up.

The Physical Aspect

In taking up this subject it is well to note that very often a slightly increased initial cost will more than repay the additional outlay through reduced cost of maintenance. For instance, it has been found by the careful analysis of accurate records on several industrial housing projects that the annual saving in masonry construction is approximately as follows:

Renewal of painting	.7 per cent
Deterioration of wood	.2 per cent
Reduction of insurance	.1 per cent
Total maintenance saving of masonry as against frame	1.0 per cent annually

In general, it is safe to state that the maintenance cost on wooden buildings will run between 3 and 6 per cent, while on masonry buildings it will average from 2 to 4 per cent. Relative depreciation costs are approximately 2 per cent annually on masonry and 5 per cent on frame.

A case in point is that of a coal company in eastern Pennsylvania, which has recently thoroughly overhauled a group of several hundred frame houses approximately forty years old. The real estate manager of this company stated that the original cost of these houses was $700 each and that the cost of overhauling them was approximately equal to that amount. In addition to this, the maintenance cost in ordinary repairs has averaged about 4 per cent per year. In this case a large sum of money would have been saved had the buildings originally been of better construction.

Immediately upon the completion of a group of industrial homes it is absolutely necessary to establish a definite policy of maintenance. Only the most inexcusable shortsightedness would permit the making of a large investment and trusting to the occupant's interest to keep up the property. In one comparatively recent development, where the group of houses was not large, no attempt at maintenance was made by the owning company. These houses were of excellent construction, having masonry walls and partitions; but in one year doors and windows were broken, water froze and damaged plumbing, woodwork was ripped out for fuel, and in all the depreciation for the first year was 10 per cent; whereas it should have been practically nothing. The cost of supervision would have been a trifle—probably not more than 10 per cent of the loss. It was noticeable that two or three houses in this group were attractive and well kept at the end of the year, having practically no depreciation. Upon inquiring into the reason for this, it was found to be merely because the women in these particular families were good housekeepers.

The close supervision of the property can best be done by a social worker who has the confidence and trust of the tenants. This question will be considered further in later paragraphs. There should be a regularly established repair crew, or if the village is a small one, a single "jack of all trades" could be employed. Reports of needed repairs will be made to the crew or to the official in charge by the social

worker and by the tenants themselves. In addition to this the crew should be instructed to make regular inspections at least monthly, and following the example of large real estate management companies a regular inspection form should be provided for report. Tenants should be educated to promptly report needed repairs, and a line should be distinctly drawn between needed repairs and alterations and additions to suit the tenants' taste. Changes and alterations which the tenant desires may well be made as a premium for the prompt payment of rent or neatness in which the place is kept.

An interesting method of keeping down repair costs, and inducing the tenant to make his own minor repairs, has been carried out by the Gerard Estate, Philadelphia, Pa., by the Octavia Hill Association, Philadelphia, Pa., and some others. If the tenant keeps the property in good repair and pays his rent promptly for eleven months, he is not required to pay the twelfth month's rent; any repairs needed are deducted from this rebate and the balance remitted to the tenant.

Another method of maintaining repairs is to make a monthly arrangement with a local firm to inspect the property and handle all repairs upon request from the owner. In making such arrangement it is best to have inspection reports made by this concern, showing needed repairs but allowing no work to be done except on direct orders from the company.

Promptness in making needed repairs means a large saving during the course of a year. A small leak in the roof if neglected would entail replastering ceilings and repairing other damage done by the water.

Following are some suggestions which offer money-saving possibilities in the maintenance of an industrial village:

After heavy storms look at the ceilings of the top floor for traces of water indicating leaky roofs.

When building is vacated, be sure the water is turned off, and in cold weather drain it from the pipes, not only in the plumbing system but where steam heat is used, from the steam heating or hot water system as well. Water should also be syringed out of traps.

See that the grading around the building is such as to shed surface water away from the building rather than bringing it into the cellar and around the foundations, with ensuing deterioration throughout the house.

Empty houses should have all rubbish removed and blinds shut and fastened on the inside and shutters over the windows. These should be inspected regularly to see that all doors and windows are locked. Very frequently a house is badly damaged by mischievous boys.

See that tenants do not drive nails into plaster or woodwork.

Picture mouldings should be furnished for hanging of wall decorations, and it has been found wise to supply each house with free picture wire and hooks.*

Periodic inspection should be made of plumbing fixtures. Leaky faucets should be repaired. Proper chemicals should be poured down kitchen sinks. This should be done in laundry trays as well, as much grease accumulates at this point.

At the end of the winter the heating systems should be gone over and smoke pipes taken down and cleaned. This will greatly increase the life of pipes.

Outside masonry should be kept pointed up, especially around the tops of chimneys.

Frequent painting of exterior woodwork not only keeps the house looking fresh, but costs no more in the end, because when neglected the wood dries out and has so increased in absorptive power that one or two extra coats have to be put on to overcome this. Buildings should be repainted at least once every three years.

Wooden structural members should be replaced wherever signs of rot appear. Rotted porch floors and steps are due to being built so that they hold rain water instead of shedding it. Porch floors should never be tongued and grooved as water is retained in the groove and rotting quickly sets in.

An important question for consideration is whether maintenance should be handled by the housing company or by an association of the tenant owners of the property. This brings up the question of the human element in the maintenance of an industrial village.

The Human Element in Maintenance

If the tenants are generally of an intelligent type, it is well to let them handle practically all matters of maintenance through a community organization. In this organization the housing company should maintain a vote of at least 25 per cent. Where houses are sold, this control is often kept by retaining the ownership of streets, parks, and playgrounds. This association may maintain a repair crew and will also cover public maintenance, such as the keeping up of lawns and parking spaces, shrubbery and trees, leaving the back yards in care of individual tenants. Where public utilities and road repairs are not maintained by the city of which the community may be a part, the community association usually has charge of these and also the shoveling of walks in winter,

*One company which recently built a large number of very cheap bungalows for foreigners has found the question of substantial plastering a most important item. The plastering in these houses was very cheap and thin, and was soon badly broken in many places. Substantial plastering in this case would have stood up much better and saved the cost of entire replastering. In these houses the evidence of the value of a properly trained social worker was soon shown. Many of the workmen and their families did not know how to live in a decent house. They destroyed interior woodwork, burned the interior doors, and in other ways caused rapid depreciation which educational work on the part of the social worker could have prevented.

the removal of garbage and ashes and other sanitary maintenance. The cost of such maintenance may be distributed against the property as a tax, or it may be carried on at the expense of the owning company until such time as the tenants may become educated to bearing their proper share.

For extension and improvement of public utilities, various methods are followed, one being to assess against individual property owners in the usual manner, another to add this potential cost to the land before resale, and still another by popular subscription. It is often found that the general community may be induced to maintain the roads and parks and to put public utilities into the housing development.

Where the class of tenants is not capable of handling such affairs they must, of course, be kept within the control of the housing company. The advantage of the community association plan is self-evident. It creates community co-operation and inspires better individual maintenance.

A trained welfare worker is perhaps the most valuable adjunct to the proper and economical maintenance of an industrial village. Among the ignorant and foreign classes, education will go a long ways in preventing deterioration. Frequently tenants of the foreign common labor class are unfamiliar with the use of toilet-room facilities, and clog the drains through ignorance, resulting in much damage. In one housing development at Bethlehem, Pa., attempts were made to remove these stoppages by taking a crow-bar and punching a hole in the porcelain. This undoubtedly cleared the stoppage, but incidentally discharged the sewage under the building.

Proper welfare conditions exercise a most beneficial influence on the problem of maintenance. We usually find that the higher we go in the various classes of city dwellers, the less is the damage done to houses by tenants or through carelessness. Bearing in mind this inverse proportion, welfare work which develops thrift, a high moral tone, and good fellowship, with the establishment of a co-operative spirit between tenant and owner, will result in direct financial benefit.

Good fellowship may be encouraged by introducing sports and social functions under the auspices of the community organization. Thrift and moral tone is spread through the medium of contagion by carefully selecting families which possess these qualities, encouraging them, and locating them so that they may act as proper examples.

As before stated, the welfare worker will be a great aid in reporting needed repairs. Rent collecting should be handled carefully, and it is always better to designate a period from the first to the fifth of every month when the tenant may come to a central office and pay rent voluntarily rather than to have a rent collector call at the individual houses.

For final consideration we have the interesting subject of community farms and gardens which should always be encouraged. If a village can be arranged with allotment gardens distributed in specially designated plots throughout the village, it has the advantages of increasing the space between buildings, bringing each individual garden nearer the owner, grouping them for common plowing and fertilizing, and decreasing the size of back yards. In case a tenant does not wish to maintain a garden, he has not a large back yard space to be neglected and filled with rubbish.

A possible development of the village association would lead to the maintenance of a farm, supplying products to the village, and distributing the products which they may raise. This farm may be carried on for educational purposes and can be made to pay its own way. The farm organization could plow the allotment gardens or even individual gardens which should be arranged so that boundary fences do not interfere. The farm organization could also manure the ground. Having a farm organization different tenants could specialize on special vegetables as assigned to them. The farm organization would collect the crops and keep proper book accounting records. The Canadian Government is working out a plan for rural community developments to provide proper home sites for returned soldiers. This plan includes farming and gardening on the co-operative plan.

The arrangement of allotment gardens has greater economic value than the same space given over to individual gardening, which must be worked by hand. Many men who are fond of gardening are often discouraged by having to do the heavy work by hand. With the allotment garden, plowing, harrowing, and similar operations can be carried out by machinery and sprinkler systems may be installed for watering.

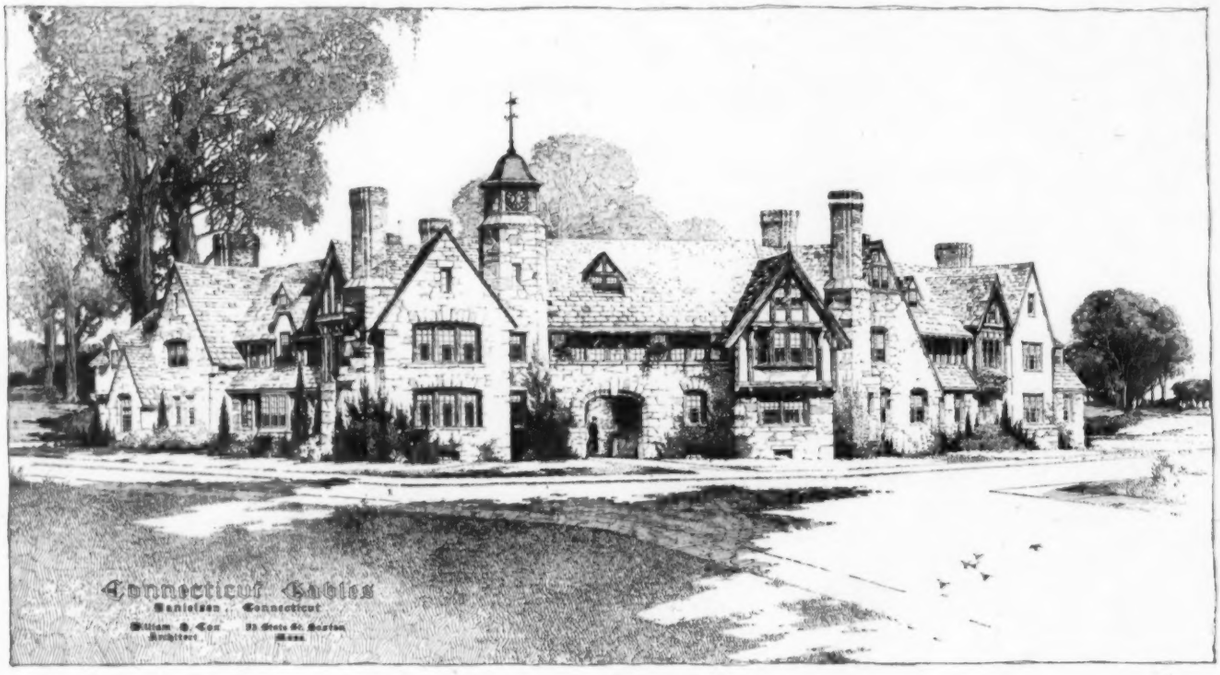
The question of maintaining property which has been sold in a village is a very important point to be considered. Certainly, unity cannot be preserved if property owned by private parties is allowed to deteriorate at least in those respects where it comes in comparison with properly maintained property, such as the sidewalks, curbs, front lawns, and street planting.

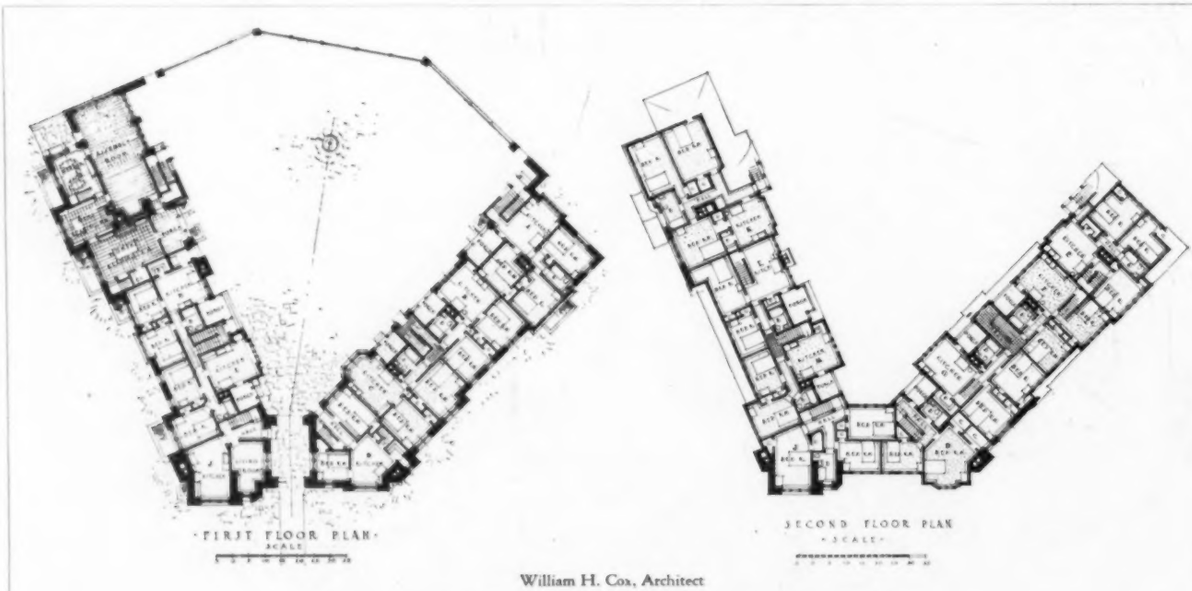
The best method of solving this problem, and one which has worked out most successfully at Kensington Gardens, Long Island, N. Y., is to impose a tax in the way of a restriction to be paid by every owner for the proper maintenance of streets, sidewalks, and planting. It was found at Kensington Gardens that a few cents a running foot of lot, amounting perhaps to $8 or $10 a year, would take care of this for each property owner.

Architectural unity is another element in making for the success of a village. The best way to obtain

this is, of course, to have all the buildings designed at one time, either by one architect or by several in consultation so as to secure unity in design and especially in grouping. If this cannot be done, but the policy of the property owners is to sell lots for individuals to build their own houses, then some form of restrictions should be made, not only as to the position of the house on the lot, the setback from the street, the height of the house, and the location of the garage, but even in the material and color of the house itself. At Forest Hills, Long Island, the roofing material was restricted to one material and color —a red shingle tile. Almost any material could be used in the house itself, but unity of roof was insisted upon, and the result most successful in maintaining the unity of the *ensemble*.

The importance of maintenance cannot be overestimated, and some form of community maintenance has proved to be in every way the most efficient and economical.





William H. Cox, Architect

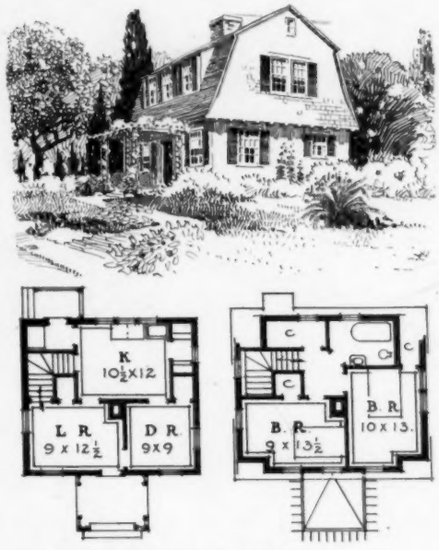
Perspective and Floor Plans of Apartment House and Community Building
Development of the Connecticut Mills Company, Danielson, Conn.

The Development of the Connecticut Mills Company at Danielson, Conn.

WILLIAM H. COX, ARCHITECT

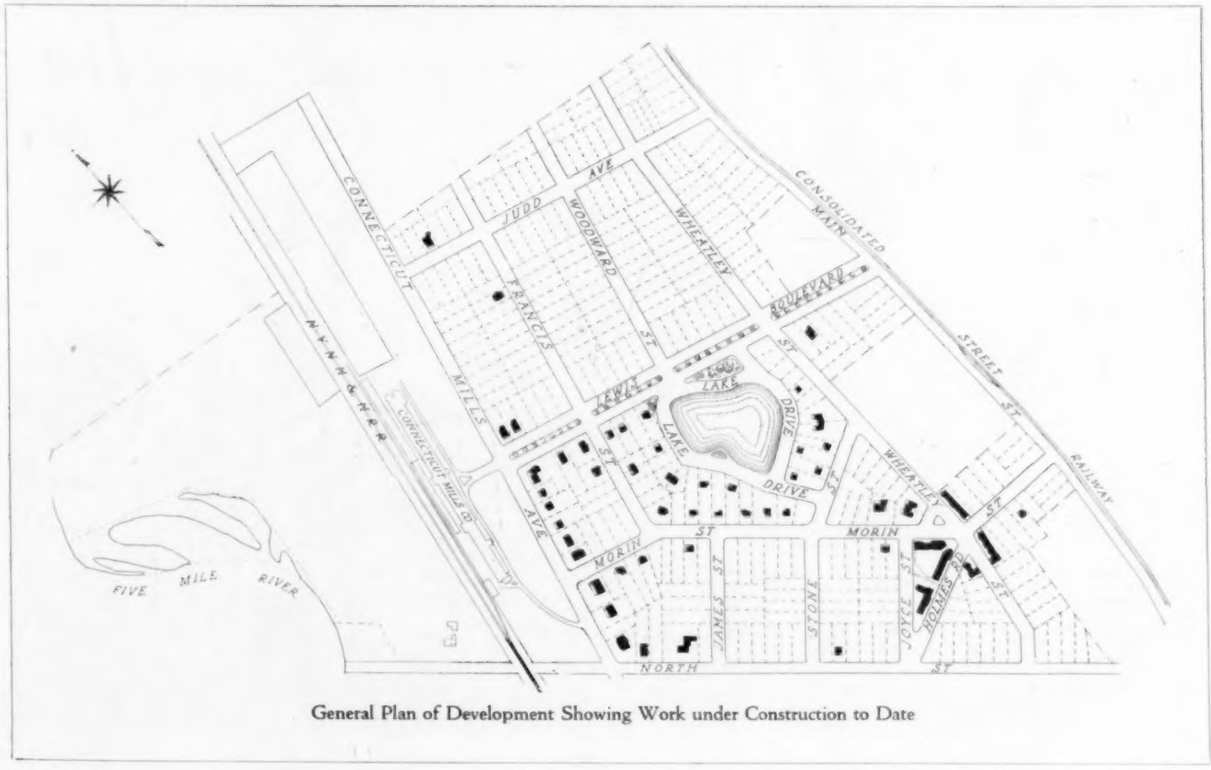
THE necessity for securing and holding contented workers was the sole factor in influencing the Connecticut Mills Company to undertake the construction of dwellings for their employees. It was due to the broad, sympathetic view of the vice-president, Mr. R. J. Caldwell, who realized that proper housing must be obtained regardless of first cost, and that the return on the investment must come in the resulting greater efficiency of employees, that the Company adopted from the beginning a plan of action following the best practices of community planning.

The property is located in gently rolling country about a mile from the center of Danielson and is bounded on the east by a main thoroughfare having street-car service and on the west by the mills and the steam railroad. The land slopes from all sides to the center of the tract where there is a small body of water which will be developed as a community feature with opportunities for swimming and other outdoor recreation. Along the rising ground from the lake small stone cottages will soon be constructed, the living rooms on the lower level overlooking the water, and the rear being but one story high to fit the grade.



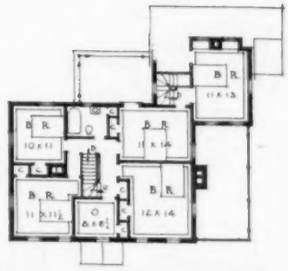
Single Frame Cottage with Shingle Exterior

Another part of the plan of special interest is the community center, of which the first building, Connecticut Gables, is now under construction. This center is being developed at the junction of Wheatley and Morin streets with Holmes Road, and if the remaining buildings to be erected attain the high standard of the apartment house shown on page 146, the group will be the most charming and picturesque to be found in any industrial community of the country. The buildings of this group are to be designed in character with the apartment house and will be of field stone, which is found on the property, and stucco and half timber work. The left wing of the Gables is given over to a community club on the first floor and contains an assembly hall, reading rooms for men and women, and a barber shop. The floors are tiled and the walls are paneled in cypress with hand-hewn beamed ceilings. The court is given a picturesque character by the outside stairs giving access to the second floor apartments, which range from three to five rooms with bath and kitchen. Adjoining the



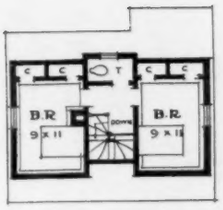
General Plan of Development Showing Work under Construction to Date

GENERAL VIEW OF WELFARE WORKER'S HOUSE



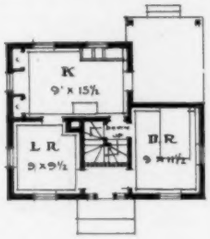
GENERAL VIEW AND FLOOR PLANS OF SUPERINTENDENT'S HOUSE

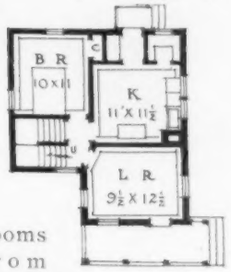
WILLIAM H. COX, ARCHITECT



Single Cottage with Floor Plans at Left. Frame and Shingle Construction. Toilet. Heated by Stoves.

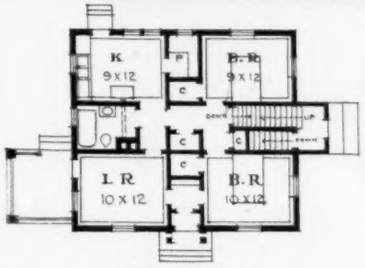
Single Cottage with Floor Plans at Right. Frame and Shingle Construction. Bathroom. Heated by Stoves.



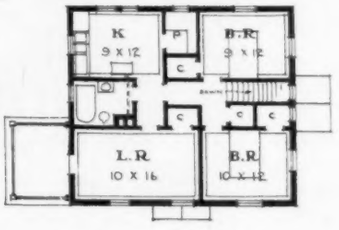


apartment on Holmes Road there is to be a school carrying out the long, low lines of the latter, and the remaining space at the corner of Wheatley and Morin streets will be devoted to store groups, the buildings to be connected by an arcaded treatment extending over the streets to form a square.

The houses are mostly of the single family type and of frame construction, though there are a few semi-detached types, a four-family house, and a two-flat house. They vary in size from four to seven rooms and from $1,500 to $2,300 in cost for single houses and $3,000 to $3,600 for semi-detached houses. They are rented to the employees at a figure approximately 10 per cent gross of the cost for the yearly rental. Most of the houses have a minimum of three bedrooms, as the workers are of chiefly French, English, and Italian nationalities, with a small percentage of Americans, and all having large families. The Company is desirous of secur-

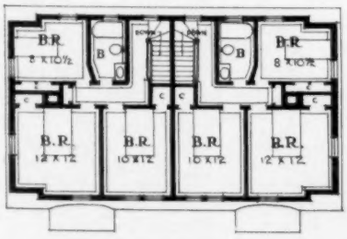


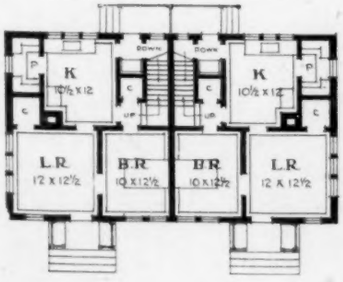
First Floor Plan



Second Floor Plan

Two-Flat House. Frame Construction. Cost $3,000 in 1917



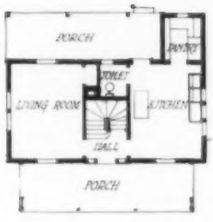


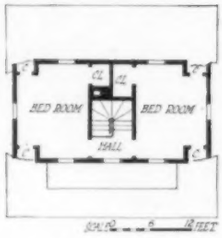
Floor Plans and Exterior View of a Two-Family House at Danielson, Conn. Frame and Shingle Construction. Cost $3,600 in 1917

William H. Cox, Architect

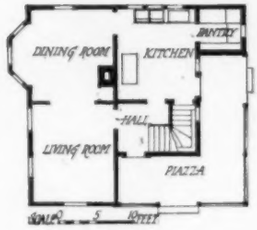
Low Rental Frame House

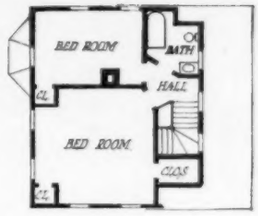
Labor Superintendent's House





THE house shown at the left is typical of the smallest built. It has no bathroom or heat, but the usual plumbing in kitchen with a toilet. It cost in 1917, $1,900. The house at the right cost in 1917, $2,200 with heat.

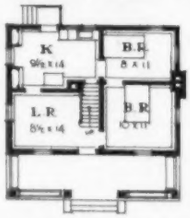


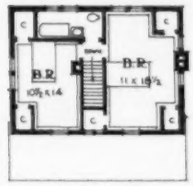


ing married workers and for that reason no special accommodations are provided for single men and women, those that are employed readily finding accommodations as boarders in the homes of the married workers.

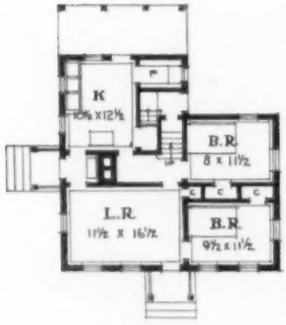
The single detached house with space for a garden has been found by the Company to be the most generally desirable. The lots vary in size from 40 to 50 feet by 100 feet deep, permitting space for gardens, and in addition allotment gardens are provided for those who want them, and the Company assumes the cost of preparing the land for cultivation. To maintain the interest of the employees and encourage a spirit of friendly rivalry prizes are offered each year to those who have the best looking yards and gardens.

The fact that the superintendent of the mills and the welfare worker have their homes on the property, tends to raise the tone of the development and also bears an influence upon its proper maintenance. The welfare worker is the person in close touch with the conditions of employment. In her home there is a kindergarten class for the young children and also an assembly room where lectures are held, besides class work among the young girls.



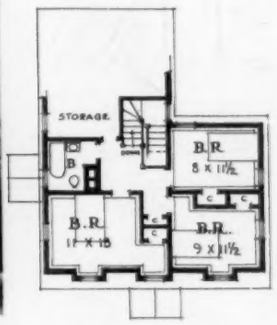


Single Frame Cottage with Bath. Heated by Stoves

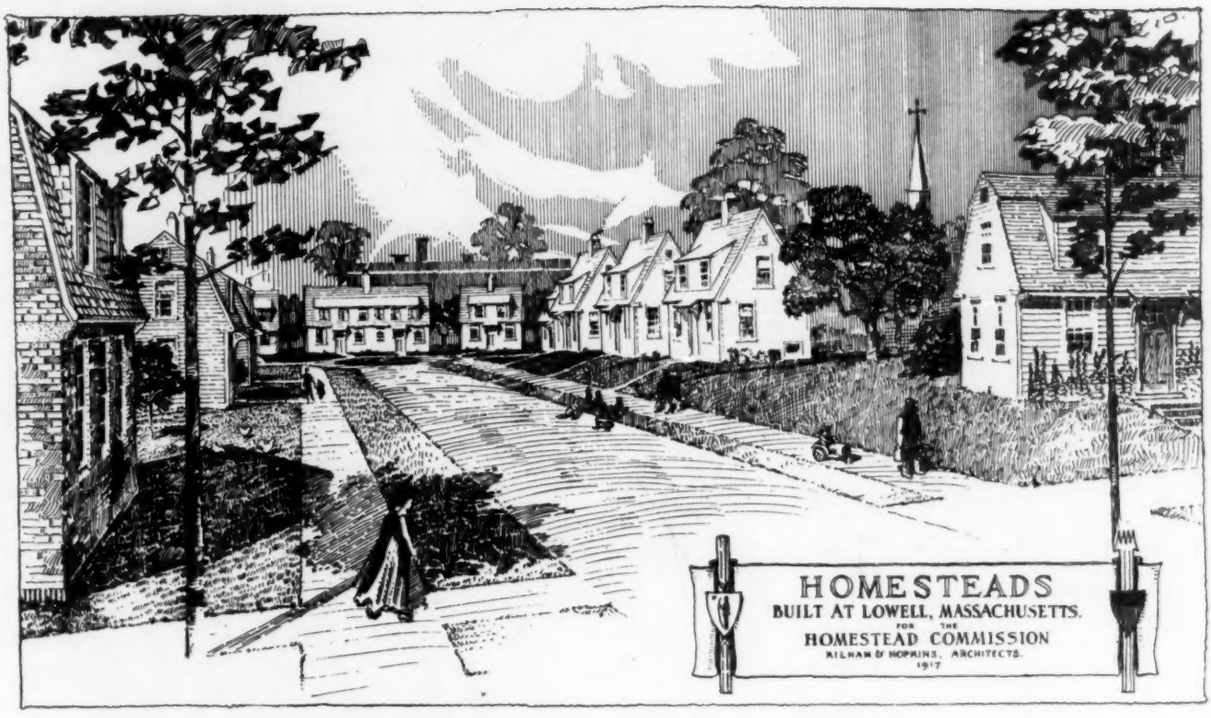


First Floor Plan

Single Frame House Designed for Large Family or for One Keeping Boarders
Built 1917. Cost $2,300



Second Floor Plan



Housing the Low Paid Workman

THE INITIAL EXPERIMENT IN GOVERNMENT AID UNDER DIRECTION OF THE MASSACHUSETTS HOMESTEAD COMMISSION

KILHAM & HOPKINS, ARCHITECTS

By WILLIAM ROGER GREELEY

WHEN the Governor and Council authorized the Massachusetts Homestead Commission to arrange for the purchase of a certain tract of land in Lowell, Mass., within easy walking distance of the business and industrial center and near many of the large mills, for the purpose of constructing groups of workingmen's cottages, to be sold upon their completion to operatives in the Lowell mills, there was formally launched the first governmental attempt in America to solve a difficult problem, namely, to prove that workingmen's houses may be built attractively, comfortably, and with fair profit at a reasonable figure.

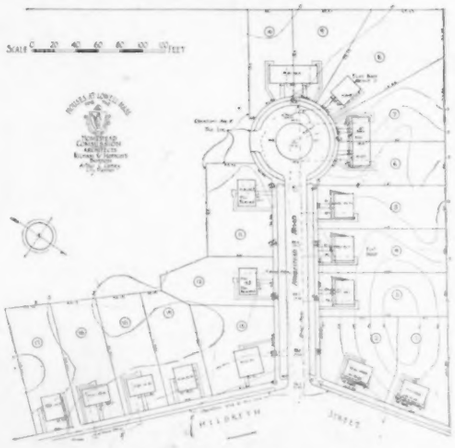
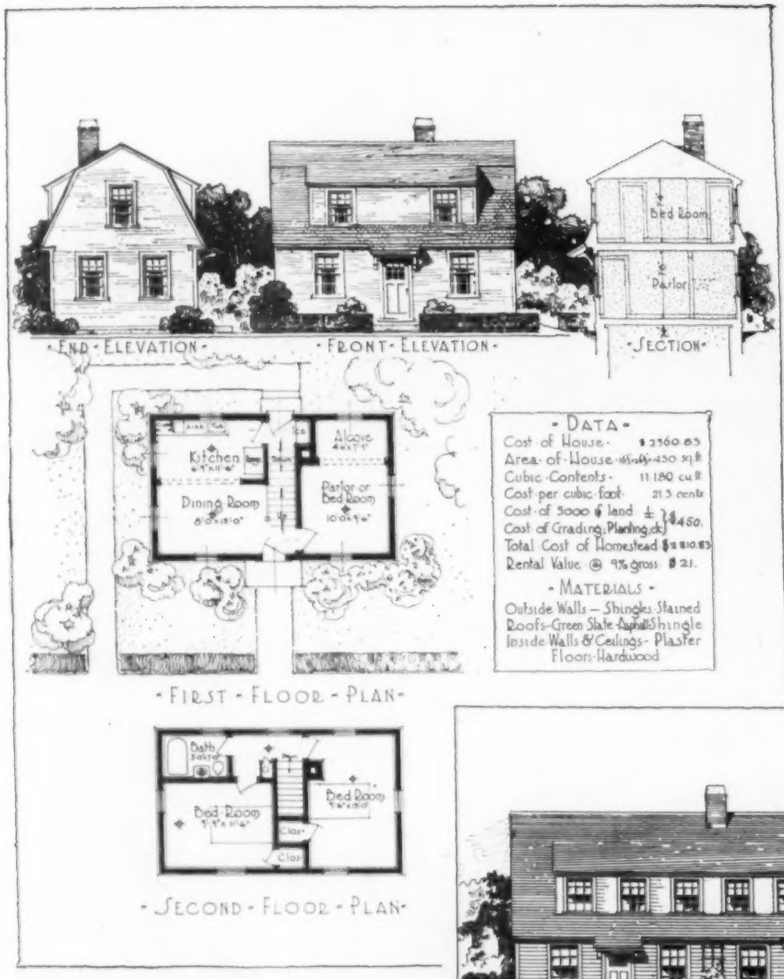


Fig. 1. Plot Plan Showing Houses Built to Date

We have imported millions of men and women to work for us as operatives in mills and as laborers in the fields, and we have kept them at work all day, and paid them off, and sent them away from the mill. They have found themselves in a strange land and without a home. We have left them to themselves and the mercy of ruthless landlords to find a place in which to live.

Years ago in Europe people began to feel it a duty to help the poor operative find a decent home. New Zealand, in an attempt to render such aid to her working classes, has so wonderfully succeeded that she puts $500,000 a year in the public treasury.

Last year Massachusetts, although carrying the heavy load of a war budget, gave heed to the recommendation of her Homestead Commission and appropriated $50,000 to help secure homesteads for her poorer citizens. By this action the United States joins the group of nations pursuing this enlightened policy. Massachusetts is steering clear of paternalism or state ownership, and intends to constitute herself a laboratory for working out the housing problem, and an agent for securing houses for the people. In the words of the Commission, " The State should experiment to learn whether or not it is possible to


Bed Room
Parlor
- END - ELEVATION -
- FRONT - ELEVATION -
- SECTION -
Kitchen
Alcove
Parlor or Bed Room
Dining Room
- DATA -
Cost of House - $ 2360.65
Area of House - 1650 sq. ft.
Cubic Contents - 11,180 cu. ft.
Cost per cubic foot - 21.3 cents
Cost of 5000 sq. ft. land + $450.
Total Cost of Homestead $2810.65
Rental Value @ 9% gross $ 21.
- MATERIALS -
Outside Walls - Shingles Stained
Roofs - Green Slate Asphalt Shingle
Inside Walls & Ceilings - Plaster
Floors - Hardwood
- FIRST - FLOOR - PLAN -
Bath Room
Bed Room
Bed Room
Clos.
Clos.
- SECOND - FLOOR - PLAN -

(Above) Fig. 3. Single House Built for Massachusetts Homestead Commission

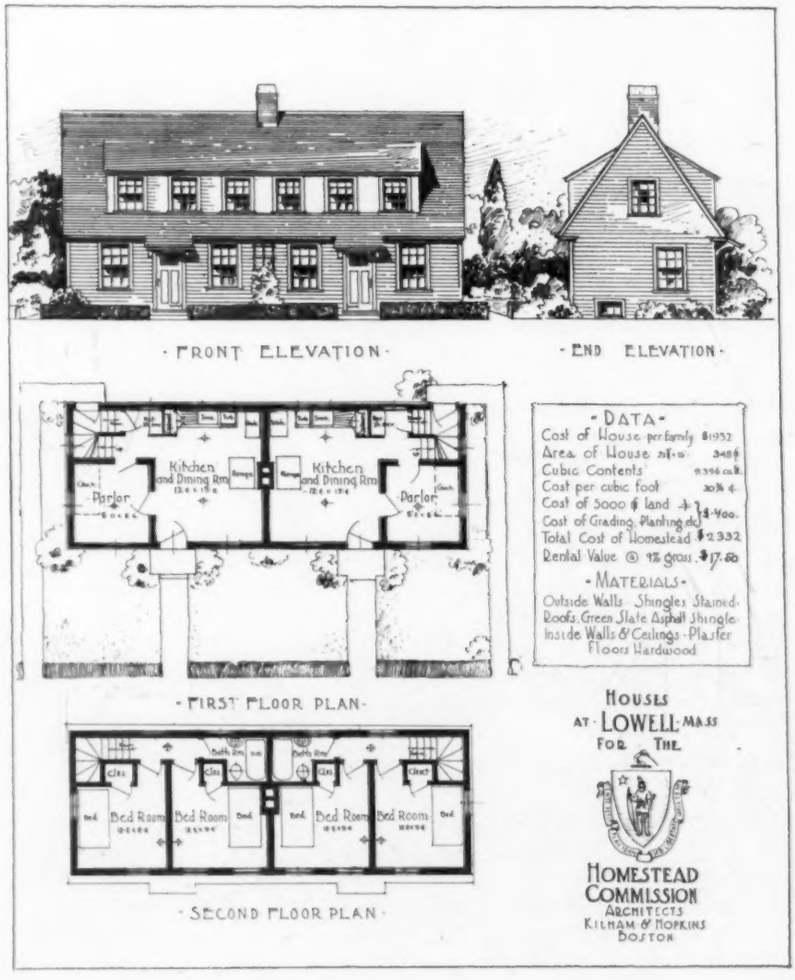
build wholesome dwellings within the means of low paid workers."

In Massachusetts there were, early in 1917, 258,000 grown men working for less than $15 per week; of this number 98,000 receive indeed less than $10 a week. As the Commission says: "Every consideration of public health, morals, well-being, and progress and stability of civilization demands that the children of these men be brought up in wholesome, healthful homes. Yet almost the only dwellings available to them are the tenements, into which they are flocking in increasing proportions."

In determining the size and character of a house a family can afford, one-quarter of the monthly income is accepted as the standard for monthly rent. The rent is computed as about 9 per cent of the selling value of the homestead. A man earning $25 a week ($108 per month) could pay $27 a month as rent. This amount would secure for him a $3,600 homestead. Land and improvements over and above the cost of the house itself can be secured for $400 or $500 in most localities, leaving $3,100 or $3,200 as the cost of the house. This price will permit the construction of a 6-room house, even at the present market prices. There is no baffling problem for the architect here. In fact, he is already solving the housing problem for families receiving $25 or more per week, and solving it well.

The more perplexing part of the problem is the working out of a plan for the man receiving not more than

(Below) Fig. 2. Double House Built for Massachusetts Homestead Commission



$15 per week. Unfortunately, there are more of this class than of any other.

This part of the housing question has been the one to which the Homestead Commission of Massachusetts has addressed itself in all seriousness and devotion. The results so far are interesting, but the problem is not yet solved.

First the Commission undertook to analyze the needs of the family, and arrived at conclusions differing in some respects from the standards developed and tacitly accepted by housing interests. They agreed in the major divisions of the house,—living room, kitchen, three bedrooms, and bath, but differed in the matter of height of rooms, believing 7 ft. 8 in. and 7 ft. 4 in. to be high enough for first and second floors, respectively. There is no virtue in the slight additional amount of air contained in a room 8 ft. high when it is sealed up with closed doors and windows, and there is much gained in appearance by the lower stud, as it gives increased apparent size owing to the improved proportions of the small rooms. It also justifies itself in the saving in cost, and the more attractive exterior lines of the house.

The standards agreed upon, by housing experts for the one- and two-family house for mill workers, are in part as follows:

Number of rooms normally, four.

Size of rooms.

Large bedroom, 10 by 12 ft. to 12 by 14 ft.

Small bedroom, minimum size, 80 sq. ft., minimum width, 7 ft.

Parlor, 10 by 12 ft. to 12 by 14 ft.

Dining room, 10 by 12 ft. to 12 by 14 ft.

Fig. 5. Workmen's Houses at Salem, Mass.
Kilham & Hopkins, Architects

Kitchen (where there is no dining room), 10 by 12 ft. to 12 by 14 ft.

Where there is a dining room, a kitchenette 80 sq. ft. in area with minimum width of 6 ft. is acceptable.

Ceiling heights. Minimum, 8 ft. clear.

Cellar. Well lighted, cross ventilated, dry and paved, minimum height, 6 ft. 6 in. clear, not essential under whole house; where omitted, house to be set upon posts, stones, or wall, with 2 ft. clear space, drained and ventilated.

Windows. Each room to have at least one, two where feasible; minimum size, 9 sq. ft. Heads as near ceiling as practicable.

Ventilation. By windows, transoms, or doors for all rooms.

Closet. One to bedroom, normally at least 22 in. in one dimension, and preferably with a door.

Plumbing system. Set wash tubs, preferably two in kitchen; if demanded by local custom, to be permitted in well lighted, dry, and ventilated cellar. Sink in kitchen, rim about 36 in. above floor. Bath tub. Water closet — modern type orifice of easy clearance, inside house, in well ventilated compartment, with window to open air of 3 sq. ft. minimum. Preferably impervious floor slab. Set wash-bowl, preferably in bathroom.

Heating. Individual system. If cellar is omitted, heat bath from kitchen stove.

Lighting. Electric or gas.

Cooking. Gas range.

Material of walls. Brick, tile, or concrete preferred.

Roof. Fire-resisting material for surface.

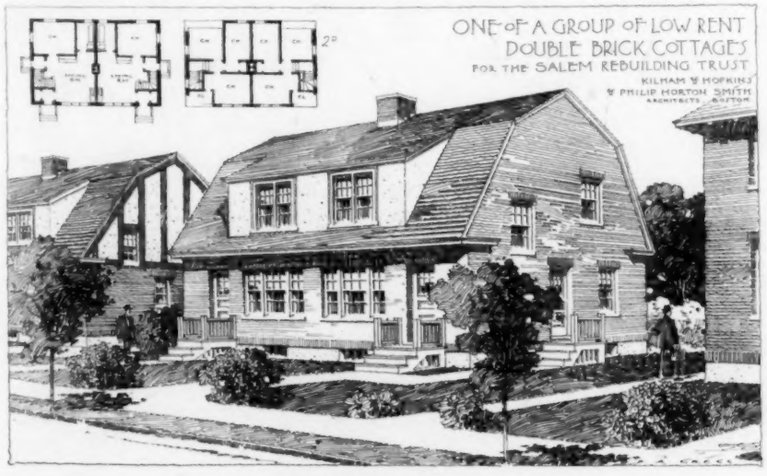


Fig. 4. Workmen's Houses at Salem, Mass.
Kilham & Hopkins, Architects

The question of materials is important. Evolution and experience have pointed to the frame house as the "fittest survivor" of the exacting conditions existing in New England. It is cheap, warm, dry, easy to build, to enlarge or alter. It is practically as safe from conflagration as a house with exterior walls of masonry if built with fire-resisting roof and with proper space between houses. No other kind of construction offers the same combination of advantages for this lowest type of house. Masonry offers less resistance to cold and heat, as engineers have proved. It is not so dry. It is more difficult to enlarge or alter and presents more work in building, especially in winter. It costs more, although somewhat cheaper to maintain.

The Commission, however, invited proposals on masonry types and on ready cut houses as well as the wood frame. The figures submitted showed the old fashioned frame house in the lead.

Contracts were let for a number of houses of three types, as follows:

Semi-detached, 4-room — 16 by 22 ft., $1,932.00
Single, 5-room — 18 by 22 ft..... 2,313.00
Single, 5-room — 16 by 26 ft..... $2,360.83

The houses were designed with two types of roof, as shown in the general perspective view, the roofs being covered with slate surfaced asbestos shingles. The contractors included complete cemented cellar, plumbing, hot and cold water, electric lights, hardwood floors, plastered walls and ceilings, paper on walls at 15 cents a roll, double hung windows, special frame, double thick glass, firestops, trap door and vents to attic, and four plumbing fixtures and sill cock.

The illustrations show two of the types under contract at Lowell: one (Fig. 2), the 4-room, semi-detached house costing $1,932; the other (Fig. 3), the 5-room single dwelling at $2,360.83. For the sake of comparison we have shown two houses constructed in 1915: one (Fig. 4) with 5 rooms; the other (Fig. 5) with 4 rooms. These were built for the Salem Rebuilding Trust at Salem, Mass., after the big fire of June, 1914, and are of brick with slate roofs. The 5-room house cost $1,888 — $44 less than the 4-room wood frame house with asphalt slate shingles at Lowell. The 4-room house at Salem cost $1,736 as against $1,932 for the Lowell house — an increase of 11 per cent plus the difference between materials.

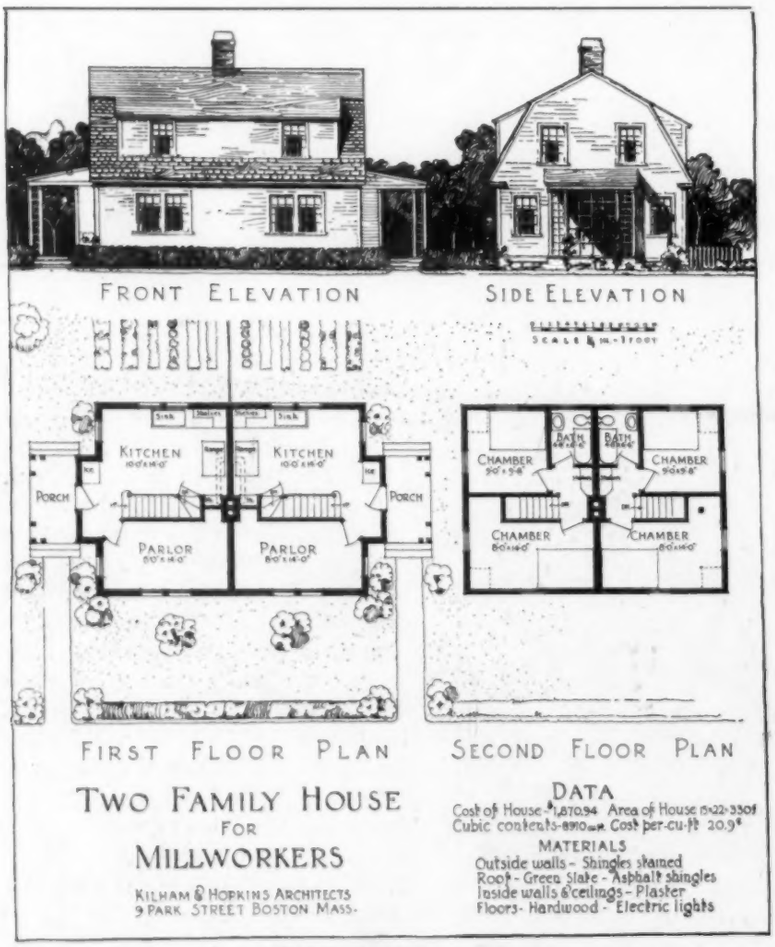


Fig. 6. Low Paid Workman's House to Cost $1,870 per Family
Kilham & Hopkins, Architects

A third type of house is shown in Fig. 6. This is the result of an effort to build, at present market prices, a house costing only $1,870, and yet conforming to the required standards. It is intended to meet the needs of the lowest paid workman's family. Such a family cannot be Americanized at one fell swoop. This plan gives them a cellar, hot and cold water in sink, bath tub and washbowl, hardwood floors, electric lights, etc., but permits them to follow their former habits in the matter of eating in the kitchen and heating the house by the coal range. They are helped to avoid disorder by the substitution of an alcove or a wall space for the closet ordinarily provided in a bedroom.

Just a word may be ventured here on the matter of the kitchen. The source of the greatest ill health in a family is the unnatural dryness of the indoor air in winter. In the housing field there is only one economical humidifier — the tea-kettle. Moisture, as a by-product of cooking, costs nothing extra, but is a fine health promoter. With a gas range and a furnace this advantage disappears.

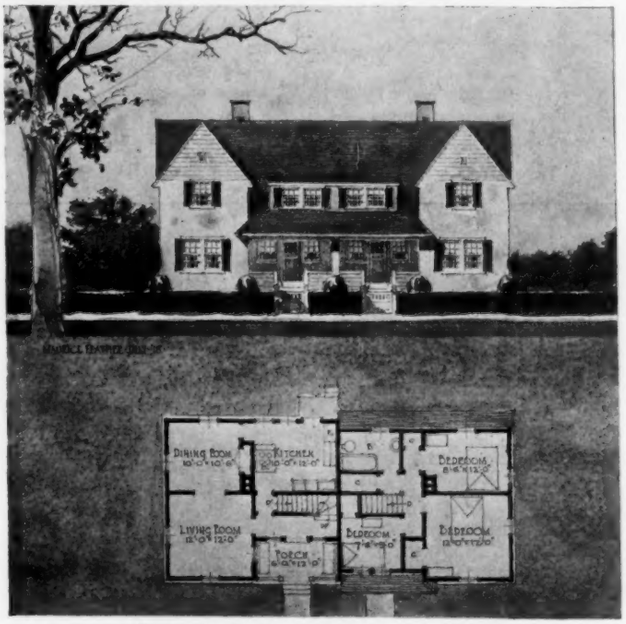
House Types in Industrial Communities

PREPARED FOR CLIENT COMPANIES OF INDUSTRIAL SERVICE AND EQUIPMENT COMPANY
GEORGE F. MARLOWE, CONSULTING ARCHITECT

THE accompanying drawings of workingmen's houses have been selected from a series made by the Industrial Service and Equipment Company, George F. Marlowe, consulting architect, in part, for use by housing associations in the communities where mills of the American Felt Company and the Daniel Green Felt Shoe Company are located. These localities embrace Saxonville, Hyde Park, and Franklin, Mass., Glenville, Conn., and Dolgeville, N. Y.

These companies, with whose ownership Willett, Sears & Co. of Boston are identified, employ an unusually high class of labor, and an obvious attempt has been made to provide houses of a type somewhat better than that of the usual industrial housing development of this country. They are by no means extravagant in any manner, but are of sufficient size and attractiveness to meet the special conditions.

The tracts to be developed vary in size from a few acres to a hundred, and in each case they have been carefully studied as a definite part of a town planning project in connection with existing local conditions.

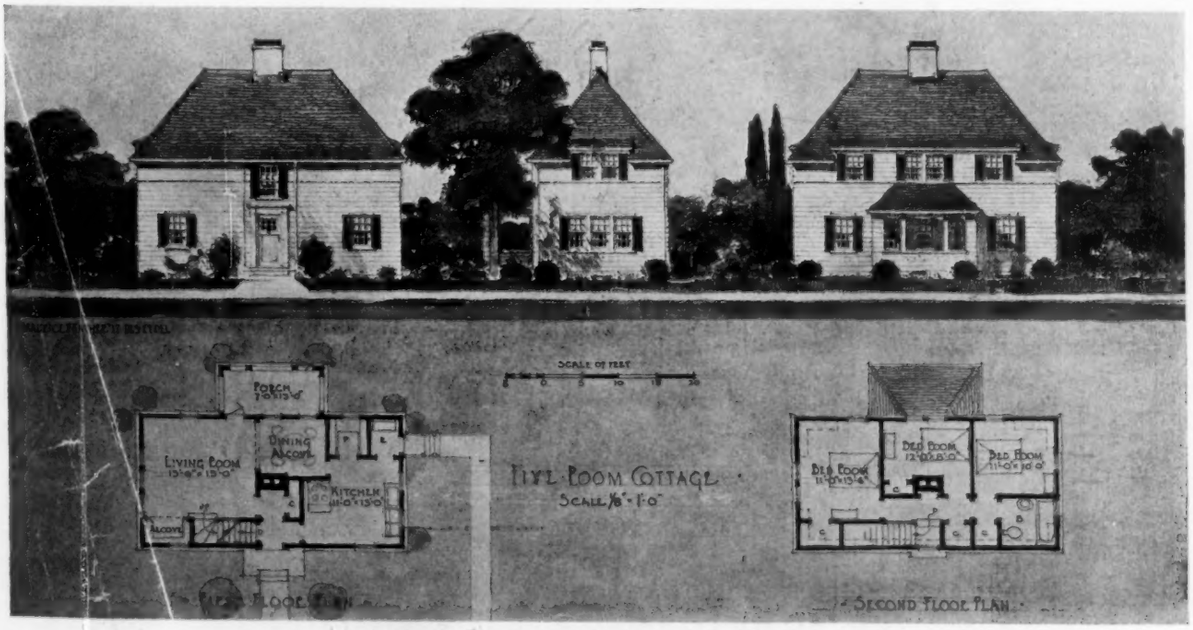


Design for Six-Room, Semi-Detached House

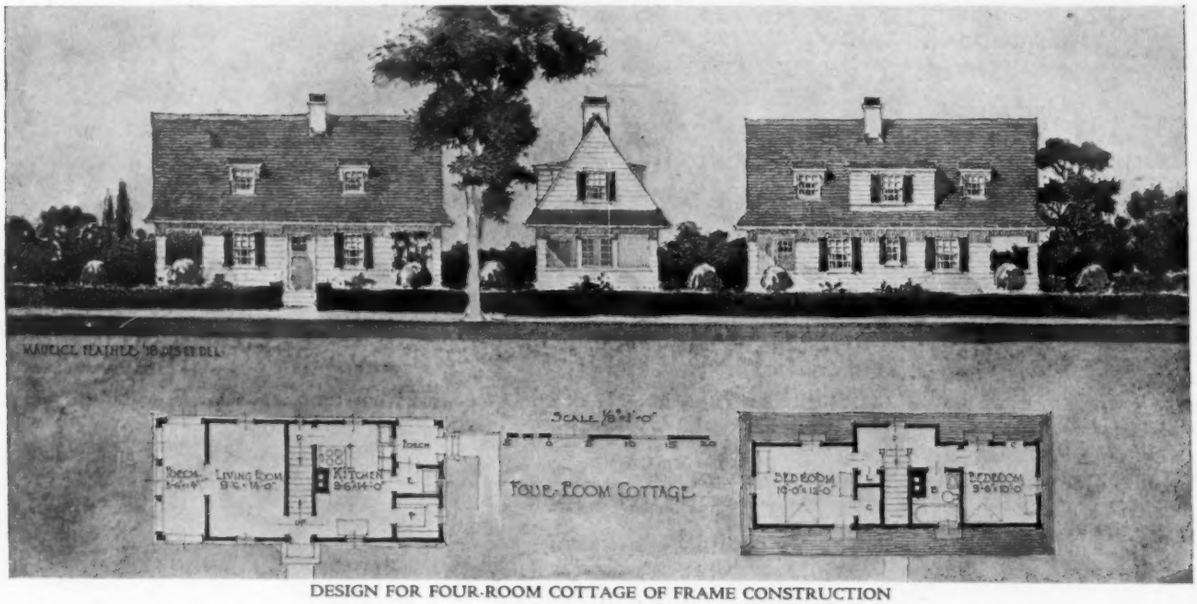
It is the intention to standardize plans, specifications, and materials so far as possible. The varying uses of similar gables, dormers, porches, etc., as shown by the drawings illustrated, effect pleasing compositions and do not reduce the architectural treatment to monotony. The houses are designed generally to be of clapboards or shingles painted white, or in some cases stucco. The larger houses for foremen and superintendents are to be heated with small hot air furnaces, but the simpler types are so arranged as to be heated by stoves. All houses have bathrooms equipped with three fixtures and the kitchens are to have soapstone laundry trays and sink, as well as built-in dressers in houses where no separate pantry is provided.

It is the intention to do a certain amount of planting of hedges, shrubbery and trees in each of the developments; in fact, to obtain as much as possible of the attractive quality of the English garden villages.

The houses have been figured to cost from $1,800 per family for the four-room units in blocks up to $3,000 and $4,000 for the more pretentious single houses.

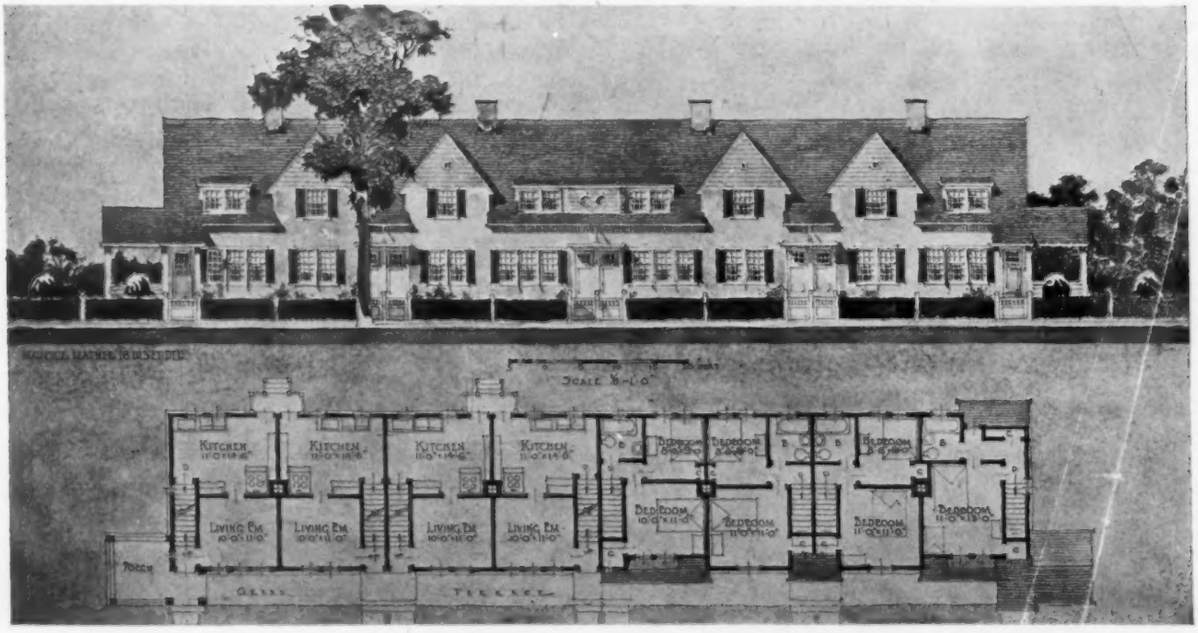


Design for Five-Room, Single Cottage of Frame Construction



DESIGN FOR FOUR-ROOM COTTAGE OF FRAME CONSTRUCTION

DESIGN FOR GROUP OF FOUR HOUSES SIMILAR IN PLAN TO THAT BELOW



DESIGN FOR GROUP OF EIGHT FOUR-ROOM HOUSES
GEORGE F. MARLOWE, CONSULTING ARCHITECT FOR INDUSTRIAL SERVICE & EQUIPMENT CO.

Living Close to the Melting Pot

SUGGESTIONS FOR MEETING THE CONDITIONS OF HOUSING IMPOSED BY FOREIGN-BORN LABORERS FROM INTIMATE OBSERVATION OF THEIR HABITS AND NATIONAL CHARACTERISTICS

By MARGUERITE WALKER JORDAN

An adequate description of the living quarters occupied by the single men and women workers of our industries would occupy more space than is put at my disposal—to do it briefly and truthfully would mean the combined swear words of many languages. I will therefore only sketch conditions as they are found in many parts of the country and indicate the chief national traits and customs of the various workers that must be recognized in planning industrial villages and boarding places that will enlist their interest and produce the results in increased contentment and decreased turnover so much needed.

Unfortunately many workers are accustomed to living quarters like these—so it takes a little time and education before the advantages of the better home or boarding house are appreciated.

To begin with, almost every plant owner has a boarding house or two somewhere about his plant; just where in many cases he doesn't know, for he has certainly never visited it; yet he would visit anything or anybody who would show him how to get twenty-five or fifty good workmen. As a rule, men come to a manufacturing or mining place alone, try the work for a while, leave, or send for their families. Their whole first impression is largely formed by their boarding house. This is usually run by a man who has no responsibility to the company, outside of paying his rent and being well "cussed," if most of the men leave at the same time.

As you enter this average boarding house, built on those familiar, ugly, oblong lines, you come into a long, narrow passageway. Through the dirt of the side walls and the smoke of the ceiling you are barely able to distinguish that white was the original color of the plaster. To the right is a room whose principal object of furniture is a dirty, red-hot, eggshell stove, or a radiator which doesn't radiate; around the walls are a few greasy, narrow, high benches; the windows are nailed shut and are so dirty that you can't see out. This is true of the entire house, where the air can be cut with a knife. The dining room is furnished with more greasy benches and one long, narrow, home made table. Brown oilcloth may or may not be there; but regardless of its covering or lack of covering, the table still needs its maiden bath. It is littered with scraps of food, chunks of bread, white boiled beans, and huge piles of greasy, hard fried meat. There are greasy plates as well, whose weight in the hands of an irate boarder make them dangerous weapons.

It is eleven o'clock; in the kitchen an old hag is slouching about, boiling beans and frying more meat. Half washed clothes are in one corner and dirty, discarded working garments piled over and under a dozen or two beer cases. Behind the stove some Slavs are trying to steal enough water from a pot of boiling clothes to get their Sunday bath. If the floor space is sufficient, you may open the back door, for a breath of fresh air would be agreeable; but as you behold that which is apparently the town garbage dump, you find that you were mistaken.

You hastily turn and begin to climb the stairs, which, by the way, are so built that every ray of light is successfully excluded. All the bedrooms are just the same. If this boarding house happens to be in a mining town, the palatial chairs are powder cans. The beds are wire cots with heaps of ragged, dirty, cotton comforts. When the beds fail to go around, the inmates sleep on the floor, which looks equally inviting. Two years ago men were paying $30 a month for such quarters, and yet the combined brains of a powerful organization were frantically putting forth every effort to get employees.

Sometimes the men live in small shanties, where they cook their own food, or get it at a nearby "hash house." Nobody knows how many men sleep in a room.

The presence of the foreign laborer greatly complicates the living problem, but many times his superior

A family that still shows the effects of its late environment. The restfulness of curved streets, comfortable cottages, and other community features have not been felt sufficiently long to create an interest in gardening and flowers.

efficiency or continuous labor makes his contentment worthy of serious consideration. Whether foreign labor is in small or large groups, the Roumanian, the Italian, and the Slav make three distinct and separate classes, and experience has proved that they will not live together. They are united on one thing, however, and that is the great underground railroad of good and bad news which they feel is their only means of defense and education. If one Italian has been unjustly treated, every other foreigner knows it and feels it, says nothing, but remembers. One day, to a trusted friend he will announce that he is leaving that night or in the morning. Heretofore you have thought that everything was all right; but he will tell you grievances that he has been brooding over for two months, and moving is apparently no hardship to his family — or to any class of labor, as far as that is concerned, for "They fold their tents like the Arabs and as silently steal away." Their life is largely made up of many little things; and if you are in position ever really to know them, you will be surprised by the importance which they attach to the simplest things.

I was once suddenly made responsible for the dormitories of the "Floating Gang," and bedclothes became a sore trial. Cotton comforts, after one washing, became an unusable, soggy mass of wadded cotton and faded calico, so that there was no warmth in them. Blankets they would not use, and the men had to sleep in their working clothes. I knew this condition was affecting their efficiency. One day I happened to think of the feather beds which came over in the steerage, and I realized that, even in this country, wealth is sometimes rated by the number of feather beds. So we immediately bought a quantity of feathers and set all the available foreign women to work making big feather comfortables, improving upon the foreign custom by making covers of unbleached domestic, firm enough to keep the ticking and feathers always clean. The men were delighted. One great big, homesick chap said to me, with tears in his eyes, "O nica lady, it littl lika home." The fame of our beds went everywhere and it was called *Matterassi di penna* (Feather Bed House) until at length everything about the company, to the disgust of the august general manager, was prefixed with the title Feather Bed.

Taken as a whole, foreigners are simple but heavy eaters; huge loaves of bread are put right on the table and every man helps himself. They have adopted the American custom and have become heavy meat eaters, but this meat is always put into a thick, highly flavored soup. Then there are goulashes of various descriptions. They are extremely fond of pork and garlic, consuming it in unbelievable quantities. The Macedonians must have strong coffee, preferably Turkish. Arbuckle's has been the real, though unsuspected, reason for many a Macedonian getting a new job. The Italians, of course, have their macaroni with, if possible, the best Roman imported cheese; olive oil, green peppers, tomatoes, and parsley are used in many combinations. If they have their own garden plots, they will raise bushels of tomatoes. When these are very ripe, they are cooked and spread out in the sun to dry until a paste is formed, which sometimes is stored in jars, or when very dry is rolled and cut. I have been in homes where the very walls were literally covered with these rolls; sometimes just before it goes into the soup, the dust and cobwebs are washed off. If they do not have this home-made product, they buy an expensive imported paste.

The manufacturer or plan towner who must house large numbers of foreigners will find many difficulties; for our foreigners are not naturally inclined to the large boarding houses. The tendency of such places is overcrowding and "railroad rooms," such as gave rise to the disgraceful "Hungary Hollow" of East St. Louis, Ill. Places like these are largely responsible for the antipathy which the average foreigner feels toward a big boarding house. They want and seek the "hominess" that comes through a small family group. They prefer to board in a family where the "boarding missus" does the washing and cooking and "for stays" the Polish, or whatever food they are used to. At the end of the month they divide the bills among themselves, beer included, allowing so much for the "boarding boss." Sometimes these boarding houses are of a low order, and the men invariably sink to the type of the house they live in. The morals of the Italian and American are about on a par, the Russian and Polish are not so good, while those of the Transylvania Slav are possibly the best. As a rule they get along very nicely, settling any quarrels among themselves. If, however, a complaint ever comes in "Missus too much dirty" — beware, for what they consider unclean, we would consider unspeakable.

This preference for home life is discussed merely as giving us a working knowledge of foreign charac-

teristics. It is not advisable to keep boarders except in houses particularly planned for such purposes. The entrance to the boarders' rooms should be separate from the family apartments, the dining room being the only common meeting ground. Two boarders to a home is best, four the maximum.

There are many attendant boarding house evils, particularly the terrific infant mortality, largely due to the overworked "boarding missus," who hasn't the time to care for her own children.

If conditions are such that you must provide living quarters for large numbers of foreign workmen, plan from the beginning to take care of your three groups: Italian, Roumanian, and Slav in separate quarters. Such buildings need to be homelike and comfortable. No matter how simple, or what class of workmen are to be housed, have the lines pleasing. Let the design inside and out be attractive and the colors good. Pleasing appearance is a tremendous factor, affecting even the roughest men. Such an appearance is dependent more on good taste than large expenditure. Although the average manufacturer would hoot at it, a decorator with a little forest green stain, some lattice work, and a sprig of ivy can impart to the dingiest place that atmosphere so dear to the heart of the Italians. If the walls are finished in washable paint, they need not be dark. The Roumanians and Italians are accustomed to brilliant colors, which if properly handled need not be garish.

For unskilled workmen it is particularly desirable to have all toilet facilities on the ground floor conveniently accessible to the entrance; this saves repairing of plaster and also helps keep soiled clothes out of the bedrooms. Ample light and ventilation must be provided; if it cannot be secured on the ground floor, then first floor space must be used, for such facilities are vitally related to health and ultimate efficiency. The best plumbing pays, and no matter how dirty the rest of the house becomes, the toilet and washroom must be kept immaculate; otherwise the place will be dreadfully abused and finally fall into disuse. The men prefer shower baths, but it is well to have one or two tubs. Hot water must always be provided.

To maintain a boarding house of this kind requires intelligent supervision, and, by the way, I don't consider the company plain clothes man suitable for the job; it needs the co-operation of a person whom the men can really trust and like. There is a certain type of woman who is admirably suited for this work. The foreigners respond warmly to a little interest in their personal affairs, and if the thing is handled right, the men will take as much pride and interest in guests being shown through their living quarters as do the superintendents who are responsible for them. If there are several boarding houses, a little healthy rivalry can be stimulated which will accomplish wonders.

This is the kind of house in which foreigners like to board; the young couple have two boarders, the house being so planned that their rooms are separated from the family apartment. This is a double house, with entrances on opposite sides.

Recently, while in Colorado, the social worker whom I was with asked a man if his wife could knit. He immediately became excited and with hands, eyes, and tongue said, "My wife — lady — she can knit, she can knit like the devil." His partner, heretofore ignored, immediately joined in, "Lady — my wife — she can knit — she can knit like two devils." Of course it's possible that such a spirit may be due to that Western atmosphere; but regardless of geographical limitations, friendly rivalry is a valuable trait quite capable of development even in people whom we may have thought bouvine.

In an all American boarding house, especially for unskilled labor, the cafeteria system of serving food is the easiest and most practical.

The recreation facilities in these houses are important, though often a difficult feature. The skilled men will need a smoker and pool room on the first floor; on each bedroom floor a small writing and reading room. If this is the only building of its kind in the town, gymnasium facilities should be added. Foreigners and unskilled laborers need a general living room. A pool room is not usually considered necessary. If there are groups of these boarding houses, a municipal amusement and recreation hall is best. If the town is small, or greatly scattered, such facilities must be provided by the company or an independent organization. The most successful ventures of this kind which have come under my observation were operated by the industry direct. In planning the activities of such an amusement building it is well to hold in mind that Sunday is the wage earner's day of recreation, and that our foreigners are accustomed to the Continental Sabbath.

Recreation for men is so dependent upon local conditions that it is most difficult to lay fixed rules. We know, however, that it must be provided in order to obtain the maximum efficiency from any class of workers.

The problem of providing living quarters for women is unrelated to that of housing men. Present conditions, however, are making it acute, and we know

that England has increased the production in her munitions factories by providing suitable living quarters for women workers. In this country several attempts to do it have been unsuccessful. The failures are due to unattractive houses, groups too large for adequate supervision, and lack of consideration for the girls' work and social life.

English experience has proved that it is neither wise nor liked by the girls to house more than 150 in a unit; the problems of management are increased, and the social and moral difficulties are great. The minimum number should not be less than 75, as it is essential for these houses to be entirely self-supporting; and on the amount of board proportioned to the girls' wages this cannot be done with a smaller group. The non-English-speaking girls should never be housed more than 75 in a group until they become used to the American customs. Many older women object to the larger group because of the noise, confusion, and consequent lack of rest. Colored girls and women must always live by themselves. Younger girls will need social life and an opportunity to entertain visitors.

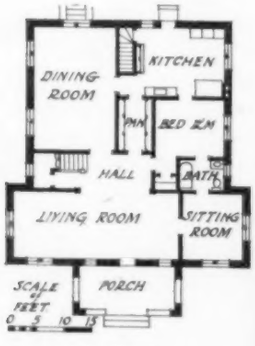
In addition to providing an excellent housekeeper there must be a social head to these houses, a woman of tact, experience, and personality, with a sincere interest in all girl life and girl problems.

A building of this kind should have an attractive, homelike entrance, with the office on one side; opening out of it several small parlors. One wing of the building may contain the recreation hall and dining room, this space so arranged that it can be used as one room. In the dining room it is well to have the serving table at one end, cafeteria service can be used at noon; but as a diet of pie, cake, and salad does not tend toward increasing efficiency, it is better to provide a set menu for two meals each day. Near the dining room there should be a lavatory so that girls coming directly from their work can wash their hands before eating. The general living room should have a stage at one end and a fireplace on the side wall; this room can also be used for gymnasium and general social purposes. Recreation the girls must have, and without it they will be neither happy nor contented. A coat room for men, as well as a retiring room, will be needed on this floor.

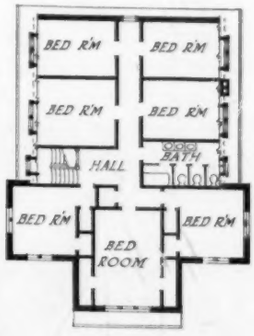
It is best to have the bedrooms all single, about 8 by 12 feet. On each floor there should be a small work room, equipped with sewing facilities, adjoining a sitting room for use of the girls only, and separated from the halls by arches or pillars.

In providing living quarters for industries' single men and women, the one thing of most importance, judged from the experience of social workers, is a human viewpoint — an appreciation of the other fellow's vision.

There is one little story of environment and ignorance often told before, but it helps us to get a proper attitude. An Italian woman of New York's East Side saw some roses. At first she didn't think they were real, and when finally convinced she sang out, "Roses from Italia," and to all arguments she answered, "No — Italia — no roses in America." The population of the whole block, which is about that of a village, crowded around the flowers, each one carrying away a petal or a leaf. And the discards of a florist shop called forth a surge of song, "Roses from Italia," "Roses from Italia," which was like a song of home by a lost people.



First Floor Plan



Second Floor Plan

Two of these houses are located in the industrial village of the Viscose Company, one for women workers and the other for men. Each accommodates fourteen persons, two occupying each room. They are conducted by a matron who has an apartment on the first floor. The construction is of brick with slate roofs. Other views and plans of complete development were published in The Brickbuilder, December, 1916.

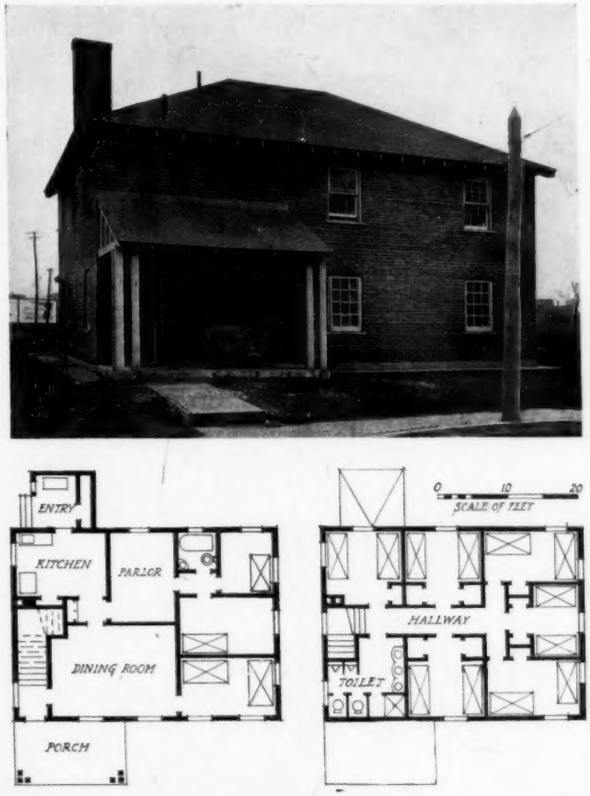
Boarding House, Industrial Village of the Viscose Company, Marcus Hook, Pa.

Ballinger & Perrot, Architects

Housing the Single Worker

By WALTER H. KILHAM

BEFORE the war the designing of lodging houses on a large scale for single industrial workers had not been developed or even discussed to any great extent. Some establishments located in towns where suitable boarding places were lacking found it necessary in order to retain desirable single men and women in their employ to provide reasonably attractive buildings near the mills, where they could be comfortably lodged and fed and be at the same time more or less under control. The employees sometimes remained permanently at these boarding places, but more often the accommodations were found most useful for the worker who had newly arrived at the plant, and needed time to look about for a permanent lodging. These boarding places were apt to be conducted in old buildings whose construction often dated from the early days of the plant and they offer little of the present-day interest.



Exterior and Floor Plans of Boarding House at Jefferson Rouge, Mich.
Development of Solvay Process Co.
Mann & MacNeille, Architects
Conducted by family; accommodates 14 men

To keep up with the present industrial expansion it is found that comfortable quarters for both male and female single workers are absolutely essential. It was at first thought that these people who often left fairly comfortable homes to go to the industrial centers would be contented to occupy rooms in such private homes as would be patriotically, or otherwise, opened to them. The "take a roomer" campaign had a brief and inglorious career, however, for neither the men nor women workers showed any keen desire to share the restraints of private family life, not to mention the variable quality of such cooking as they might encounter. Workers of both sexes desired first, freedom to go and come without too much question; and second, to mingle with one another rather than with persons of other occupations. The construction of modern boarding and lodging houses, therefore, has become a feature of the new housing movement and one which still needs more study before the final solution is achieved.

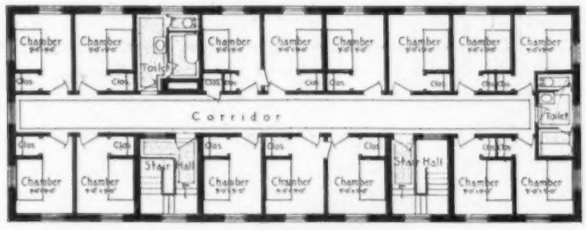
The English "hostel" comes first to the front for consideration. This may be taken in general to mean either a regular dormitory, with numerous beds arranged along the walls of a single long room, or the same system arranged in cubicles about 6 or 7 by 8 feet, with dwarf partitions around each bed, each cubicle having its own window. In England some of these projects were so designed as to allow of the barrack-like buildings being later converted into row houses.

Study of this proposition, however, brought out the opinion that these hostels would never attain the desired objective which was to bring about the formation of a body of workers who would be sufficiently contented to remain at the plant in preference to looking for better conditions elsewhere; in other words, such a stabilization of labor as would insure the plant against the ill effects of the dreaded "overturn"—the bane of war-time industrial expansion. It became evident that the workers would not only want actual rooms of reasonable size, but finally that they must be single rooms, as otherwise the inevitable disagreements between roommates would nullify the good results of the whole proceeding. The size of each room it seemed, ought to be 70 square feet, if possible, and the width should not be less than 7 feet. A minimum of 60 square feet with a width of 6 feet might be permissible, but is not advocated.

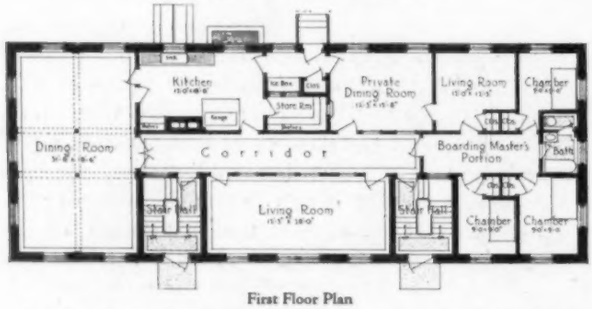
So far the present conclusions are alike for men and women. Being agreed that separation of the sexes is desirable, the question of what variations in plan are necessary comes up for study and with it the various matters of minor detail.

Next to the bedroom arrangement comes the question of toilets. Private baths are not yet a feature of

the industrial boarding house, although judging by present and prospective wage increases they may become so in a not too distant future. Until such time the proportion of fixtures to be installed may be taken as for girls about 1 shower for 10 girls, 1 water closet for 6 girls, 1 bowl for 10 girls, 1 tub in each bathroom. For men about the same proportion with the possible change of substituting 1 water closet and 1 urinal for 10 persons. The tubs, water closets, and showers should be in separate compartments so as to allow the fullest utilization of the facilities of the room. In men's boarding houses the wash bowls may be in the open room; in women's they may be in one room, but should be separated by stall-like partitions, about 2 feet deep and 5 or 6 feet high. Syphon jet water closets are not as desirable as those having an orifice of easier clearance. The great question of tubs and showers still remains at the front. Evidently one or more tubs should be installed in any case in either type of toilet room for the use of elderly persons or those slightly indisposed. Beyond that men will soon become accustomed to the overhead shower and enjoy it. Women object to the overhead shower on account of wetting the hair and say they need the horizontal or "body" type. Even at that some protest against them. A lady at the recent conference of the National Housing Association caused some amusement when this question arose by stating that women over thirty preferred tubs, while showers were desired by those under thirty, thus creating a rather entangling situation which most architects would doubtless be anxious to avoid and "pass the buck" on to the social worker.



Second Floor Plan (Third Floor Similar)



First Floor Plan

Boarding House for the Naumkeag Steam Cotton Co., Salem, Mass.
Kilham & Hopkins, Architects
Conducted by company; accommodates 30 men; brick and frame construction; stairways fireproof. Cost $20,150 in 1914

A good sized cheerful general living or recreation room is essential, which to save space may, if desired, be entered directly from outside like the office of an hotel. In cold climates, however, a vestibule ought to be provided. For women workers one or more separate small reception rooms are essential for the entertainment of male visitors, so as to obviate the necessity of the use either of a bedroom or the street corner for this purpose. In either case the entrance to the bedroom portion should be clearly visible from the living room or office. It is far better, particularly with women, to have the place constructed so as to be easily and quietly supervised than to enforce restrictions and rules which only serve to irritate the lodgers, and perhaps drive them to questionable locations.

The amount of recreation facilities naturally will depend upon the size of the building. If it expands to several hundred rooms (700 has been set as a tentative maximum), it becomes evident that certain luxuries may be added beyond the carrying capacity of a small establishment. Thus a lounge, with open fireplace, billiard room, bowling alleys, etc., may be added for men, and good dancing facilities for women; in fact, these latter ought to be provided in some form for women in any case. Halls for entertainment, lectures, or picture shows are clearly within the scope of a large establishment, but they form a special problem which would usually be provided for in a separate building, open to the dwellers in cottages as well.

Women of whatever condition have a natural desire to do a little cooking, even if of a rudimentary sort, and a lodging house of any size ought to provide on each floor a sort of kitchenette where fudge, molasses candy, or other forms of light edibles can be prepared and enjoyed on nights and Sundays.

Closets in bedrooms are still a matter of discussion. "Welfare" workers deplore the enclosed closet with a door, saying that it is dark, close, and harbors vermin, and advocate either a shelf with a curtain or at least the omission of the door. Others say that the lodgers are entitled to a regular closet the same as any other people. If the door is provided, it would seem as if the top and bottom panels might be open to create a circulation of air. In all cases the bed and bureau space with the position of the electric light must be carefully studied.

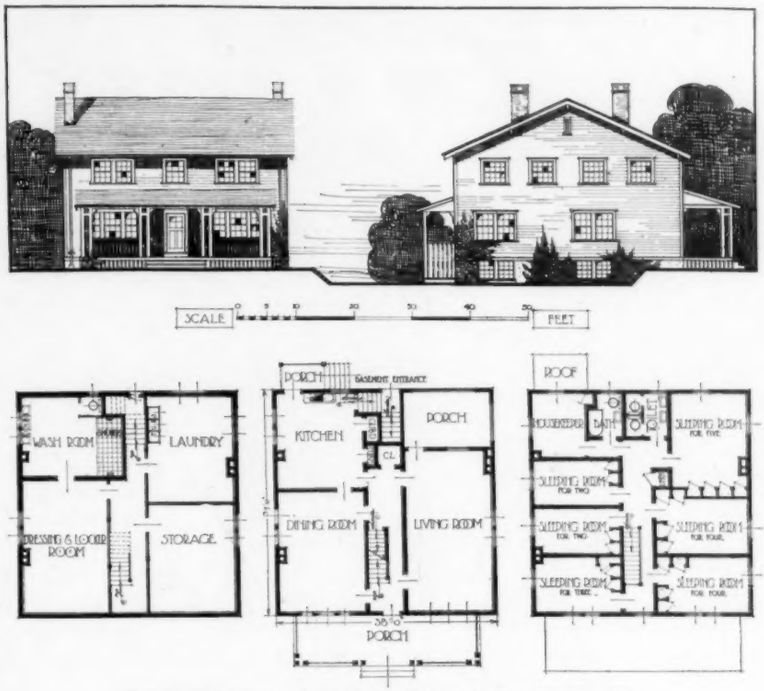
Cross ventilation of rooms should be provided by placing transoms over the doors and placing doors opposite each other across the corridor. Slat panels

in doors may also be worth considering for obtaining ventilation.

The kitchen, pantry, and dining room require no especial description at this point, as their disposition must depend upon the size of the house, whether cafeteria service is installed or not, etc. For women a convenient and cheerful sewing room with sewing machines and electric flatirons ought to be included.

In houses designed for either sex a laundry with set tubs and drying and ironing facilities should be provided for the use of lodgers, together with the assurance of plenty of hot water.

A suite of two or three rooms with bath and dining room (which may be served from the general pantry), with an entirely separate entrance from outside, has to be provided for the boarding master and his family, and probably accommodations for the servants according to local conditions, and of course the usual provisions for linen, brooms, mops, etc., on each floor are understood. A dry room in the basement or attic for the storage of trunks ought also to be included.



Boarding House for the Ohio Steel Foundry Co., Bucyrus, Ohio
George H. Schwan, Architect

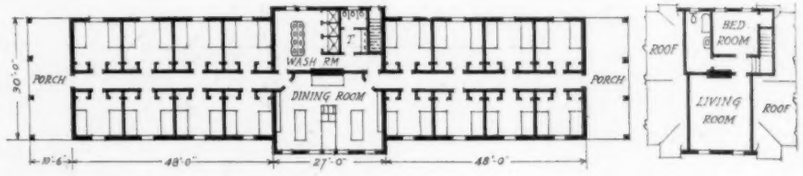
Accommodates 20 foreign workmen and housekeeper. Rooms have double decked iron beds and individual lockers ventilated through ceiling. Basement, above grade, contains showers. Erected July, 1917, and cost complete $6,300 for frame construction.

Some of the plans for medium sized boarding houses seem not to have well considered the question of proper fire exits. A house even of ten or twelve rooms is no longer a private residence, with the conventional (but absolutely inadequate) single stairway; it becomes an embryo hotel and subject to the dangers of a habitation containing a number of strangers of varying habits and temperaments. Two or more stairways are necessary, enclosed in doors separating them from the corridors, and if needed fire escapes must be added. Fireproof construction should be obligatory if the building is over three stories and is recommended in any case.

The Young Women's Christian Association has done some constructive work in developing a type of building which would be suitable for the accommodation of women workers. Their pamphlet of "Suggestions" contains interesting hints on "How Girls should be Grouped," from which the following may be quoted:

1. Younger girls should live in groups where they can have social life and an opportunity to entertain their friends, but still be under some of the restrictions of the home.

2. Older women want independence of living. Many of them object to living in large groups because of the noise and confusion and ensuing fatigue.



Boarding House for Rome Brass & Copper Co., Rome, N. Y.
Mann & MacNeille, Architects

Accommodates 32 foreign workmen, who furnish their own food which is prepared in dining room. Master's suite on second floor. Exterior walls hollow tile with textured surface. Partitions and roof frame

3. In every case, colored girls and women should live by themselves, and provision should be made for their social life.

4. It has been found that it is more successful to house the non-English-speaking foreign girls in small groups, until they learn English and become used to American customs. A social worker should be employed to work with them.

The pamphlet describes the "Type A" building designed by Duncan Candler of New York, and reproduced on page 166, as follows:

Type A building, the permanent structure that the Y. W. C. A. is building as a demonstration in Charleston for girls working in the naval uniform factory, is designed for use in places where only one building will be erected. It includes not only living and dining rooms, but also recreational facilities. There are adequate fire escapes outside the building, as well as two fire walls inside.

The dining room and recreation hall, several parlors, and bedrooms for 44 girls are on the first floor. There is but one entrance for the residents. This makes it possible for the matron or social head of the house, who is in the office near the door, to see every one who comes in or goes out.

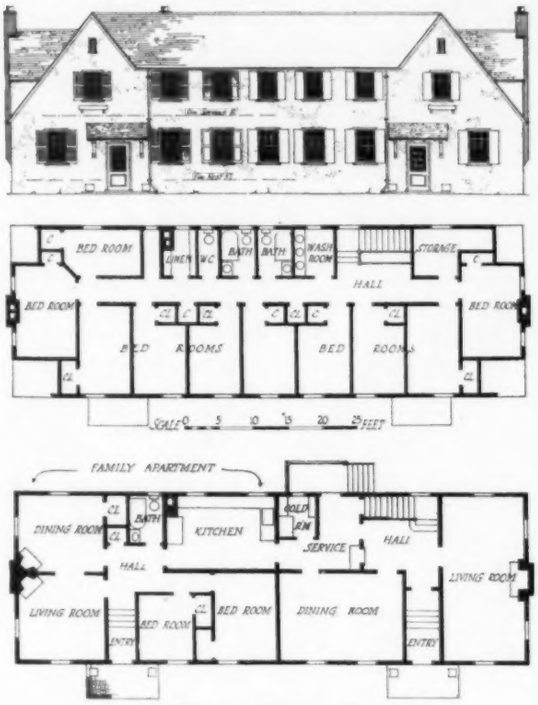
The entrance hall is attractive and homelike. Opening out of it are several parlors separated from the hall by arches. To the right is an entrance to the wing containing the recreation hall and dining room. These rooms are so arranged that they can be thrown into one for a large social gathering.

The dining room is reached also by an entrance from the porch outside. This makes it possible for people to go to lunch in the cafeteria without passing through the house. There is a lavatory with wash bowls and toilets adjacent to the dining room, giving an opportunity to the girls who come directly from work to wash their hands before eating. This is important both from the point of view of cleanliness and for the sake of the girls' health.

The dining room is arranged with a serving table at one end, that can be used for cafeteria service at noon if desired. For the other two meals a set menu should be provided, as the girls choose very unwisely if left to themselves.

The recreation hall has windows on three sides with a set stage at one end. There is a fireplace in the side wall. This room can be used for a gymnasium and for social parties. It can also be arranged in such a way that several classes can be held at the same time in different parts of the room.

In order to get to the sleeping rooms on the first floor, it is necessary to pass the office. Next to the office is a room with a private bath for the head of the house. The bedrooms are all single, 8 by 12 feet.



Boarding House at Kingsport Farms, Tenn.
Clinton Mackenzie, Architect
Accommodates skilled workmen; living quarters on first floor; all sleeping rooms on second; family apartment on first floor

Dormitory for Remington Arms Company, Bridgeport, Conn.
Hiss & Weekes, Architects
Accommodates 135 girls. Entertaining facilities on first floor. A restaurant, the use of which is optional, is in the basement. Six dollars per week is the average cost of board and room

Each room has a single bed, dresser, chairs and table, and closet. Single rooms not only give the privacy and quiet which girls working hard every day need, but also make the management of the house much easier.

There are bedrooms for 51 girls on the second floor. There is also a sitting room separated from the hall only by pillars. This is for the use of the girls only. Next to this is a small sewing room with facilities for sewing.

Toilets, wash bowls, and bath are grouped on each floor. There is one toilet to every 10 girls, one wash bowl to every 6 girls, and one shower to every 10 girls. There is at least one tub on each floor. Shower baths are more sanitary than tubs, and there is much less difficulty in taking care of them. They should be body showers. Each toilet, shower, and tub is in a separate compartment.

On each floor is a slop sink, a closet for brooms and pails, and one or more linen closets.

There is also on this floor a kitchenette with a gas plate, sink, and cupboard for the use of the girls.

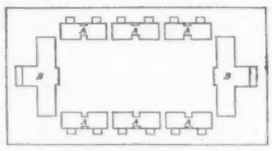
A place should be provided either on this floor or in the basement where girls can do as much of their laundry work as they wish. This laundry should have several set tubs, a drying closet, irons, ironing board, and a gas plate.

There are bedrooms for 6 girls on the third floor. There is also an infirmary and a private bath. This room has a cross draft and is in the quietest part of the house. There is a storage place for trunks on this floor.

The recreation and dining room wing of the house is one story high. All sleeping rooms are removed from noise and confusion.

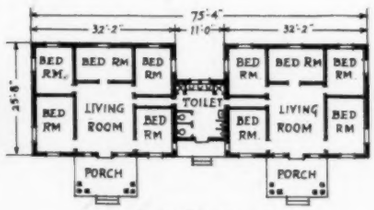
The Y. W. C. A. states that building units of not more than 150 girls are most successful. Larger units mean greater difficulties of management and supervision. At the same time the minimum number of a group should be not less than 75. Houses holding less than this number they believe cannot be self-supporting on the amount of board that the girls can and should pay. It is essential that these houses be completely self-supporting.

The boarding house of the Naumkeag Steam Cotton Company in Salem, Mass., was built after the great fire of 1914, to replace an old structure which had served for many years and is a good solution of a purely urban development, being located in a closely built section of the city. Special attention has been paid to the exits, which consist of two brick enclosures containing concrete stairs, isolated from the rest of the building by fireproof doors. Though a little severe in treatment, they give a satisfactory feeling of security. Although designed and built before the war had called general attention to the subject, the plans contain most of the features which have



Plan of Block

Typical Elevation of Bunk Houses

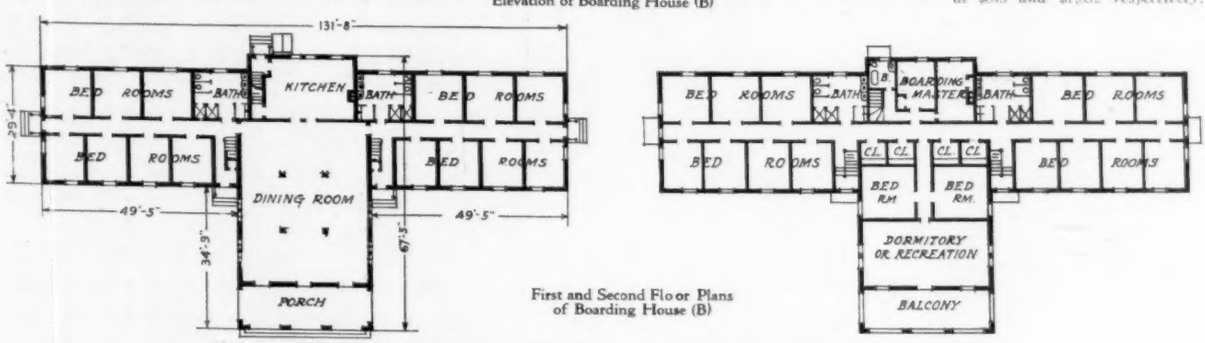


Floor Plan of Bunk House (A)

Alternate Elevation of Bunk Houses

FIVE blocks of these structures are already completed and arranged similar to the plan above. The bunk houses (A) accommodate 20 men each, 2 to a room, for a charge of $1.50 per week. Each man has an individual bed and steel locker. Their cost is as follows: temporary, $3,771; frame, $4,215; permanent $4,553, exclusive of cellar and heating. Cellars estimated at $700 and hot air heating, $400 for temporary and $300 for permanent buildings. The larger units (B) contain dining room service sufficient to accommodate all the men in the block. The cost of (B) is $15,788 for temporary and $18,389 for permanent construction, exclusive of cellar and heating. These items are estimated at $843 and $1,832 respectively.

Elevation of Boarding House (B)



First and Second Floor Plans of Boarding House (B)

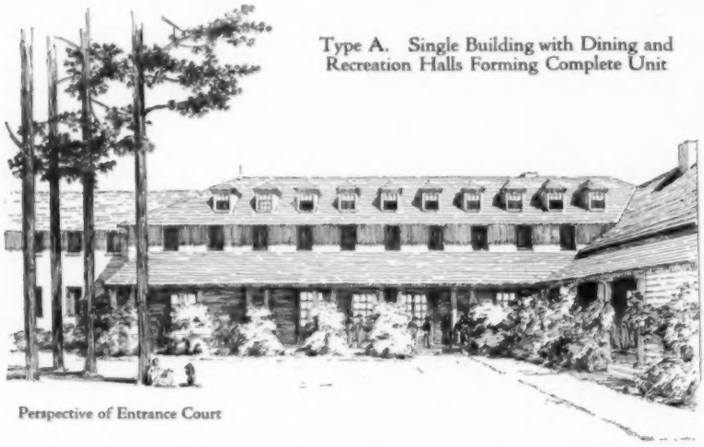
Buildings for Single Workers at Plant of Merchant Shipbuilding Corporation, Bristol, Pa.

Mann & MacNeille, Consulting Architects; P. R. MacNeille, Supervising Architect for Emergency Fleet Corporation

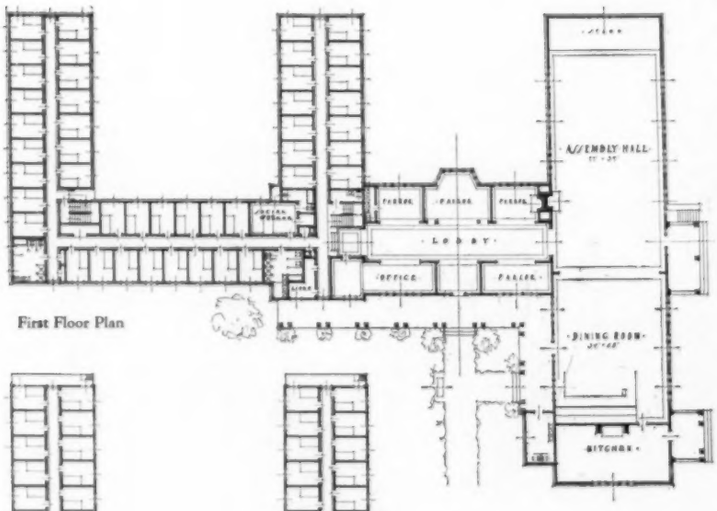
been generally adopted since. The boarding master's suite uses one of the tower entrances, but is otherwise quite well isolated. Its dining room utilizes the pantry of the main kitchen. There is a living room and general dining room on the first floor. The bedrooms are all single and have closets, and the proportion of toilet fixtures is what later investigations have shown to be correct. There are no showers. As the purpose of the building is mainly to accommodate newly arrived operatives, and as the city of Salem contains sufficient housing to absorb any overplus of employees, there was no need of a large building.

There is a certain present tendency toward a smaller class of structure, possibly of the bungalow type, with a living room and kitchenette (which may possibly be combined in one room), bathroom, and three or four bedrooms. These can be utilized by small groups of women who thus obtain a more homelike environment, although their supervision would seem to be more difficult. These bungalows may be built near a common kitchen and dining hall. Plans of some buildings of this type are illustrated herewith.

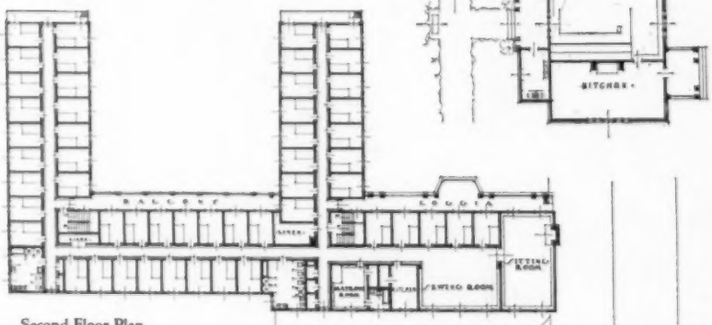
Type A. Single Building with Dining and Recreation Halls Forming Complete Unit



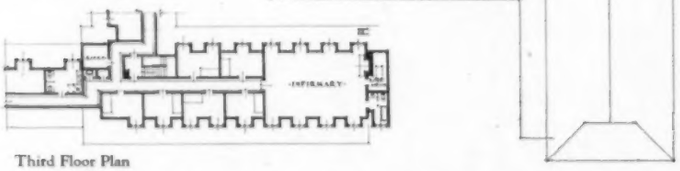
Perspective of Entrance Court



First Floor Plan



Second Floor Plan



Third Floor Plan

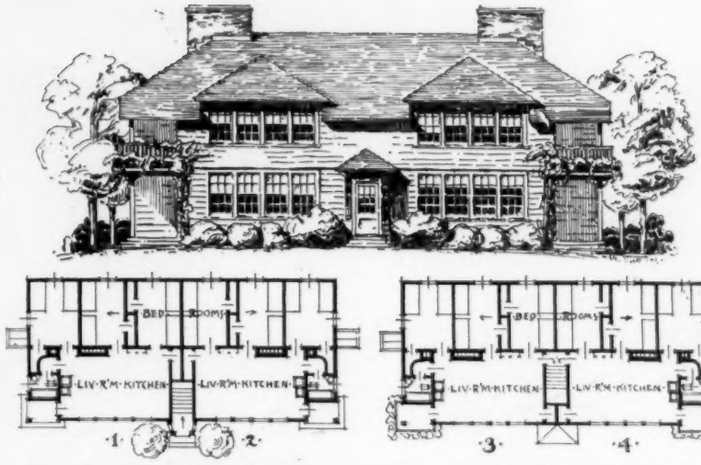
Building for Housing Committee of War Work Council, Y. W. C. A.
Duncan Candler, Architect

Then there is the type of private boarding house, operated perhaps by some workman's family who is able to accommodate several (say 5 or 6) boarders. It seems desirable in this case to group the family's private apartment on the first floor, providing a special entrance and stairway for the boarders whose chambers and bathrooms are all on the second floor, the only room where the family and boarders meet in common being the dining room. This type is probably as much open to suggestion and local experience as any. It certainly seems as if this house in particular is entitled to have some sort of a piazza for hot weather.

The question of balconies, roof promenades, etc., must be taken into account in all cases and settled according to climate and local conditions, remembering that the primary object of war housing (and it ought to be the object of any kind) is not only merely to shelter human beings from the elements, but to keep them just as comfortable, happy, and contented as the men higher up. If the new housing does not do this, it is a failure and the nation will be the chief sufferer.

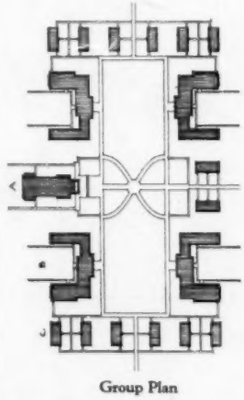
My experience in housing has led me to the conclusion that the attempt to design industrial dwellings from the top down is open to the perpetual danger of misunderstanding between the designers and the occupants. It is easy to say what sort of places another class of people ought to live in and be thankful for, but it is also desirable to put one's self in their place, particularly the wife's, and see how these well intentioned buildings really fit. I think there has been too much effort to reduce costs of industrial housing, to reduce sizes of rooms, to cut out everything not essential to bare existence, and to forget that

side by side with the theory that the worker is part of the plant, needing sanitary oversight to protect his health just as the machine needs lubrication to protect it from wear, ought to go also the idea that his house is likewise a part of the plant, to be scrapped when no longer suitable, and not to be subject to the bug-bear of "ten per cent gross" calculated on the exact visible return that each individual house may be expected to earn. A number of manufacturers have already realized this and are providing dwellings for their employees which measure above the standards now generally accepted for this type of work. Labor is not only better paid each year, but is learning through better educational facilities the desirability of higher standards of living and is rapidly arriving at a position where it will dictate its own terms, and when that time arrives it will not be satisfied with any form of housing but the best.



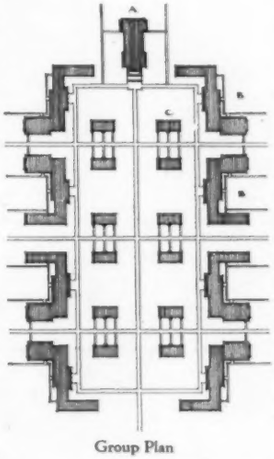
Type C. Single Building with Four Apartments. Unit of a Group for Housing Committee, War Work Council, Y. W. C. A.

THESE buildings designed for the Housing Committee of the War Work Council of the Y. W. C. A. are intended for varying needs. Type A is complete in itself; Types B and C are units of groups. Type B accommodates 150 girls and has provision for dining and sitting room space. Type C is arranged as a four-family apartment and is intended for older women who wish to live independently, or for foreign girls who are not sufficiently Americanized to mingle with others than those of their own nationality. The plot plans at either side show alternate schemes of grouping; the wings of Type B can be varied in their position to form different courts. In the larger groups a recreation building (A on the plan) is provided for social life, for in a large group some means of recreation aside from the living rooms is an obvious necessity.

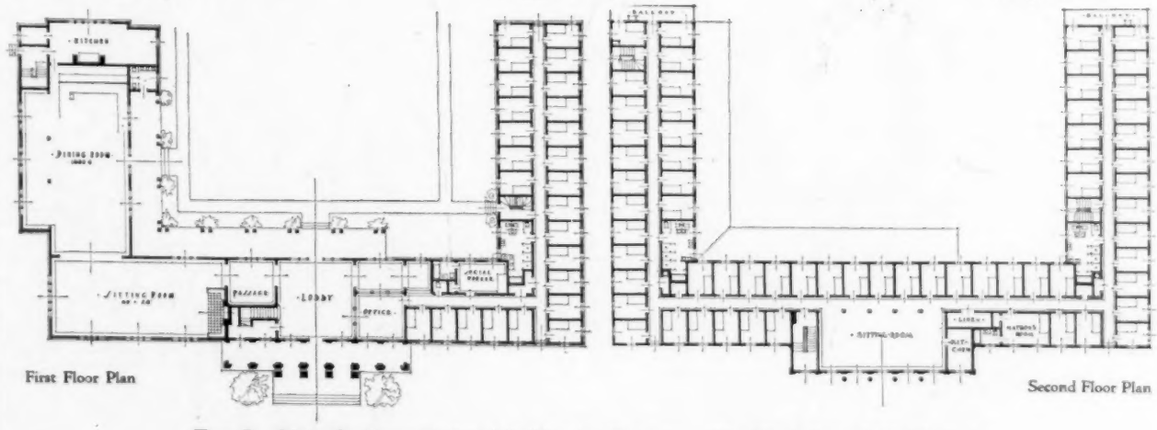


Group Plan

Elevation of Type B



Group Plan



First Floor Plan

Second Floor Plan

Type B. Unit of a Group Designed for Housing Committee, War Work Council, Y. W. C. A.
Duncan Candler, Architect

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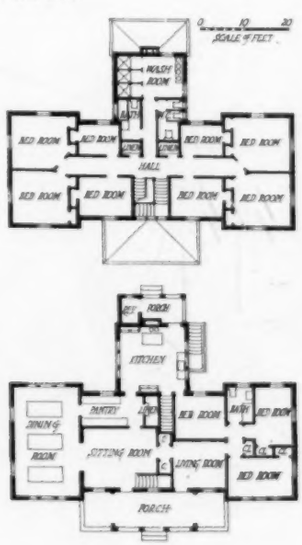

Three of these houses were completed this year at a cost of $16,250 each, or 23.2 c. per cubic foot. Each will accommodate 26 men and is to be operated by a person renting it from the company. Construction is stucco on hollow tile with wood floors and partitions. Quarry tile bath floors. Steam heat. Third floor plan similar to second.

Boarding Houses for the Bethlehem Steel Company, Sparrows Point, Md.

Edward L. Palmer, Jr., Architect

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EDITORIAL COMMENT

IN the editorial comment appearing in our February issue we stated from reports contained in the daily press that Secretary of the Treasury McAdoo had requested "the building of houses and other private structures be postponed until after the war." Later authentic information has shown that we misinterpreted the Secretary's request, which fact we deeply regret. The request was in no manner intended to impose difficulties on architects or any branch of the building trades, but was meant to apply only to the building of lavish houses for which there could be no necessity except the gratification of luxury, that could in all fairness be withheld till after the war.

There has been some misunderstanding concerning the request, and we are glad of the opportunity to present excerpts from a more detailed statement contained in a letter from Secretary McAdoo to Samuel Gompers, President of the American Federation of Labor, which we are permitted to quote:

"I have said that building operations which are not required to protect the health or provide for the comfortable needs of our people, or to supply facilities necessary for the proper conduct of business essential to the successful prosecution of the war, should be postponed.

"As you know, I have no authority to direct that building operations be curtailed. I have merely suggested that unnecessary work of that kind be postponed until the end of the war. Such postponement would, I am sure, help win the war, but every patriotic man must be determined by his own conscience in the matter and must decide for himself if he can postpone the erection of a contemplated building until the war is over. Compliance with this suggestion may cause some inconveniences which are to be greatly deplored, but such inconveniences are an unavoidable incident to war. The situation must be viewed from a national and not from a local standpoint."

Architects most certainly appreciate this viewpoint, and their patriotic and unselfish offer of service to the Government, wherever it might be used, stands as proof of their eagerness to submerge private interests to the Government welfare. For the last three years the constantly rising costs in building have practically reduced new building to terms of absolute necessity — in fact, building has been so much curtailed that in our larger cities there is to-day a serious shortage of hotels, apartments, and all buildings of residential type. The great part of the work to supply these needs will for economic reasons be postponed till after the war, but in the meantime there is need for many types of building that are essential to the proper progress of the war. The Government in its vast building program has exceeded the largest figures of private work, but it has not been carried on through the same channels, and it is only natural that certain trades and certain sections of the country should find many disadvantages in the change. It is to be hoped that this unfortunate circumstance will be minimized as much as possible through a larger and more widespread use of existing agencies by the Government instead of creating new organizations or increasing to mammoth size those already very large, which can only be done at the expense and discomfiture of the smaller units.

THE most pressing need for buildings required to further the war, though one not yet fully appreciated by Governmental authorities, is housing for the industrial workers. Production of manufactured articles not considered essential to the war is gradually being curtailed, and the workers in those industries are told their patriotic service is to seek employment in war industries, and if necessary move to new districts where this work is to be had. This immediately brings to the forefront the housing problem. The great war industries have been concentrated principally in sections of the country already thickly populated, and the great demand for living quarters in these centers is constantly being increased and will, by the time we reach the rate of production hoped for, be so evident that the lack of housing facilities will be apparent to all.

Although the first bill carrying an appropriation of $50,000,000 for housing the workers in the shipyards has been enacted into law now for some weeks, the delays which seem to be inevitable in our war preparations are already in evidence here. Notwithstanding the convincing example Great Britain has furnished of how the problem should be solved and the earnest exhortations and advice of men in our own country who have made industrial housing an important part of their study, rival bureaus in Washington are advocating widely different and opposing plans for treating the problem, and the matter of permanent construction which is so earnestly recommended by all who know the dangers to be avoided has been actually turned down in many cases.

As we go to press the progress on the second housing bill carrying an appropriation of $60,000,000 to be expended under the direction of the Department of Labor has met opposition in the Senate that would indicate absolute ignorance of the need and of economic conditions governing building in the country to-day. The bill was described by one senator as "the most obnoxious that has ever come before Congress," who added that under its provisions the Government could continue housing work after the war and thus enter the field of private enterprise. We are being looked to by our allies for the ships, guns and ammunition, food and other supplies which will sustain the armies fighting for the safety of democracy, and yet the shortage of living quarters for the industrial army required to produce these things — a national emergency — must wait upon discussion in Washington of its effect upon private interests and upon differences of opinion between rival bureaus charged with the execution of the program.

A Revision in Plan — and Opinion

The Adaptability of Metal Lath to Industrial Housing Work

COMPARATIVE COST FIGURES SHOWING GREAT ADVANTAGE OF SOUND CONSTRUCTION OBTAINED AT ONLY SLIGHT INCREASE OVER TEMPORARY WORK

THERE is no doubt that the need for living accommodations for workers, which has reached an acute stage in various localities, due to the natural concentration of war and other requirements with which our country shall "do its bit" in the Titanic struggle for mastery between unprincipled autocracy on one side and true democracy on the other, has done more to call the attention of the American people to the possibilities of making such industrial housing more protective to the occupants of the buildings than has been accomplished by all the manufacturers of fire-resistive materials, all the efforts of fire-preventive societies, and all the figures of underwriters' reports for the past twenty-five years.

The interest evinced in this subject by the various architectural publications and the space given to articles by men of high authority has been a source of gratification to those who have in the past paid out good money for space in which to advertise fire-resistive materials. Let the good work go on, and the American artisan will soon be housed in a building that will give him fire protection and afford him comfortable and hygienic living conditions; while the stupendous fire loss of the American nation amounting to $250,000,000 per annum will correspondingly be reduced to such an extent that it will no longer be a reproach to our people nor an evidence to the world of the prodigality of our expenditures.

It will interest the architectural profession to know that the officials in charge of the Government industrial housing have had results of investigations furnished to them that show unmistakably the possibilities of using a progressive, fire-resistive, and hygienic construction at a very slight extra cost over the ordinary flimsy and easily burned type of house that experts unanimously condemn.

For instance, figures were given which practically offered to furnish stucco on 26 gauge, 2½ pounds per square yard metal lath on 16-inch center studs, using composition board for the interior at a cost of $ .154 per square foot of wall, and stucco on 26 gauge, 2½ pounds metal lath on 16-inch center wood studs for the exterior, metal lath and plaster interior, ¾-inch cement stucco, outside coating at $ .206 per square foot of wall.

Considering that the cost of wood studding spaced 16 inches on centers, ⅞-inch sheathing by 4 feet, and compo board above 4 feet, including two coats of paint outside, would be $ .1684 per square foot of wall, it surely has been proven that there is no item of cost to prevent not only the Government and industrial concerns who are building for similar purposes, but the average man who builds his own house, from adopting the same class of construction.

Another comparison that will be interesting is that the figures for cheap cantonment buildings on wood studs 8 feet on centers and 4 feet under windows, ⅞-inch sheathing, tar paper, and battens, are $ .123 per square foot of wall; whereas the offer was made to produce buildings, stuccoed on metal lath outside and back plastered, instead of sheathing, tar paper, and battens, interior construction to be of compo board at $ .1372 per square foot of wall.

There is a further consideration in connection with this subject, whether the contemplated building is for private or public enterprise, and that is the question of the transportation of materials. The material to be transported for 100,000 square yards of stucco construction can be hauled to destination in fifty cars. To transport the material for wood-frame construction to give the same service would take eighty-six cars, and the haul would average about double the length. For the interior plastering to cover the same space the wood lath required would need seventeen cars to haul to destination, whereas metal lath would need only seven cars. There is thus a balance in favor of fire-resistive construction by the use of metal lath of a total of forty-six cars. With the present car shortage, railroad congestion, and the imperative need of getting supplies to the seaboard for the use of our armies and Allies, this is a point worthy of further consideration wholly aside from the intrinsic merit of the material itself.

Bostwick "TRUSS-LOOP" metal lath, which has been advertised in architectural papers for more than a quarter of a century, is a material with special characteristics which is available for a wide variety of constructions. It is a self-furring metal lath that is attached directly to the studs, giving the necessary radiation space without the need of furring; it is easily erected, and secures for the owner and builder a lower price for the finished metal lath and plaster surface than is possible with other types of material.

The Bostwick Steel Lath Company may be addressed at Niles, Ohio, and will be pleased to give details of the large finished stock that they have on hand ready for immediate shipment upon a priority order, and to show any architect interested in industrial housing projects the possibilities of the service they are in a position to render.

Adv.

A Revision in Plan — and Opinion

FOR six solid weeks, with hardly enough let-up for meals, I'd been grinding out details of the heating, lighting, and plumbing plans of one of our biggest jobs of the year. It was literally designing a whole town — four hundred and fifty small, model houses for the Deep Water Dock Company, and the whole thing was in our hands, — streets, sewers, lighting, heating, plumbing, etc.

It was impressed upon us that the completed town must be a model for convenience, comfort, sanitation, simplicity; but withal it should also be artistic — and designed to be "reasonably inexpensive."

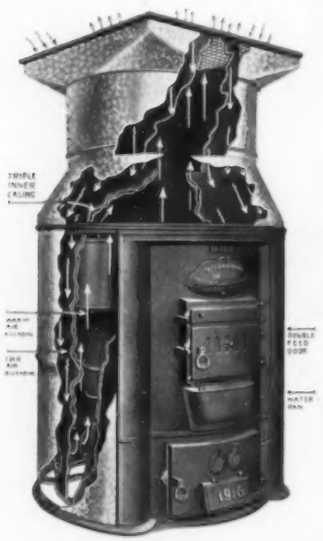
Being an engineer, not an architect, I had charge of heating, lighting, plumbing.

Some job! While it was right in our line of work, none of these big assignments is ever a cinch. They tax experience, endurance, and brain to the limit, especially when they absolutely must be completed in double quick time.

The Chief pointed out to me the "reasonably inexpensive" warning.

"These people are big operators," he said. "That expression gives you some leeway; but I am very anxious to produce this job at the lowest possible cost consistent with sound principles. It absolutely must be right; but keep down the cost all along the line as much as possible."

To make a long story short, I finished the job. On heating I had called in the engineer of a boiler manufacturer whose line I'd found O. K. and been specifying for some time. We worked out the details of individual steam boilers, ample radiation, and all that, but always keeping down costs.



International Onepipe Heater
Manufactured by
International Heater Co.
Utica, N. Y.

Plan and specifications were all O.K.'d by the Dock Company, everything was ready for signing the contracts, and I felt the satisfied relief of a good job well done.

Early in the morning of the day before Colonel Arthur of the Dock Company was coming in to go over the plans for the last time the Chief sent for me.

"George, I have a suspicion that I'm going to ask you to reopen the question of heating plans on the Deep Water Dock Company's job. Last night at the Club I met a Mr. W——, an officer of the International Heater Company of Utica, N. Y. We were discussing business, and I was telling him of the Dock Company's job and the four hundred and fifty homes. Naturally we talked heating and I told him we specified the steam boilers.

"Well, sir, he offered a suggestion for heating these homes with an altogether new system that interested me considerably. It's that furnace idea that uses only one pipe to heat a whole house — the Onepipe Heater they call it. You'll remember our discussing it once. I know we didn't think it worth a tinker's damn; but what W—— told me last night has got me guessing.

"He didn't try to sell me anything, but was merely offering a suggestion; and also he frankly admitted how they themselves, a few years ago, when this new heater appeared on the horizon, were skeptical. He said their engineers undertook it originally as a system only for small farmhouses to displace stoves.

"Well, it seems it took like wildfire among the farmers, did the trick for them so much better than stoves that all over the country they scrambled to get these new heaters. The disease spread. First to bungalows, then stores, then churches and schools. Finally, without any particular pushing on the part of the manufacturers, it reached into cities; into small individual homes, not only to displace stoves in old dwellings but for new houses as well.

"The system has apparently, by sheer reason of a merit not originally anticipated even by their own engineers, forced itself into the market on a rather big scale. From the many varied instances that W—— referred to, evidently this heating system has made good beyond anybody's expectation.

"Mr. W—— suggested the advantages of this system for the Dock Company's town: A good saving in first cost and yet using high grade equipment; a good saving in fuel to occupants of the buildings; no risk of damages by leaks, breaks, freezing, etc.; no space taken up in rooms for radiators; and yet the house is heated as well — and he ventured to prophesy better heated — than with steam.

"I asked Mr. W—— if he would come in and explain the proposition to you. He argued he was no salesman and had no intention in his suggestion of upsetting our plans or bidding for business. I assured him I should not consider it a breach of club rules, and so he's coming in at 10.

"I wish you'd look into it and let me have your ideas."

Well!

Of course, nothing to do but comply. Besides, I

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began to feel a little curious myself about these single pipe propositions. Up to then, I admit, I hadn't given them more than cursory consideration — on the very face of it, they didn't look like anything more than a makeshift contraption, outside the pale of a good engineer's specification pencil. None of the boys I believe had ever taken them seriously enough to even go into preliminary details.

Mr. W—— arrived — a very decent chap, who I found knew under his modesty a very great deal about heating. I explained the problem and, after a bit, showed him the plans. He figured the cost on the steam, and surprised me by his close accuracy. He came within $25 of our best estimate.

Then he figured the other system, basing it on cost of International Onepipe Heaters for all except the five duplex houses and the arcade, for which he suggested the steam boilers as planned.

The difference in first cost was about $40,000 !

By this time I was too interested to be startled. Nor did I feel chagrined at not having known more about "Onepipes" before. He "sold" me completely on the idea; his store of overwhelming evidence in its favor was inexhaustible.

Late that afternoon I went in to see the Chief.

"Well, George, anything to those renegade furnaces?"

"I guess there are possibilities. Perhaps $40,000 worth and then some, maybe!" I replied.

I showed him a new set of plans for the heating, in the rough.

"What, gone that far, have you?"

"Yes," I answered. "There's not much more to do. I'm going to see him again in the morning to go over it and check up. I'm satisfied. It's rather a revelation. Possibly a revolution. Here's the estimate as we doped it out together. I guess that's doing the trick 'reasonably inexpensive'!"

I could see the Chief was pleased. I could tell he too was "sold" — more than he had seen fit to indicate.

And Colonel Arthur !

Of course it was the result of extreme diligence and effort on our part in his behalf — a sort of eleventh hour spurt. All that remains unsaid in my little tale is that the town will be built this summer and International Onepipes used.

We just passed through a severe winter. I've watched a dozen or two different homes heated in this manner as a cat watches a mouse, and I've never seen anything like it for efficiency. I don't believe that anywhere in this country you can find a single village, township, or city that will be as uniformly and economically heated as that private burg of the Deep Water Dock Company.

[ADVERTISEMENT]

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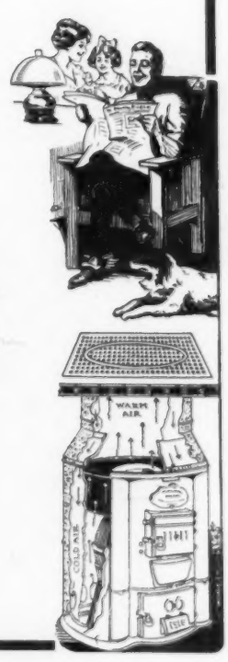

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The Goodyear Tire & Rubber Co. Development, Akron. George H. Schwan, Architect, Pittsburgh
This picturesque and successful development owes a great part of its variety to the harmonious coloring of the shingles with Cabot's Creosote Stains

Artistic Color Schemes for Housing Developments

COLOR TREATMENT OF GREAT IMPORTANCE IN HARMONIOUS RESULTS

IT IS no exaggeration to say that the external appearance of a housing group is of vastly more importance to its success than many other elements of comfort or convenience that seem to be more essential. Time spent in developing picturesque and harmonious exteriors is therefore well spent, and no other item of exterior decoration is quite as important in this problem as coloring.

One of the Akron Units
Showing use of shingles on second story and roof, making a surface for artistic color-treatment that adds greatly to its attractiveness.

In the old-fashioned corporation boarding and tenement house the finishing touch of monotonous dreariness was given by the expressionless coating of drab paint. Modern housing is studying individuality and producing artistic, harmonious color schemes that add immensely to the success of the operations. The cheapest kind of houses can be made attractive by artistic coloring, and an almost infinite variety can be obtained in small frame buildings by using the lumber in various ways and staining it in various tones. Dressed or rough siding, rough boards, clapboards, as well as shingles and other lumber, can be laid in different ways on houses of the bungalow, chalet, or cottage type, and the entire surface stained with Cabot's Creosote Stains at a cost for the whole exterior that is far less than any other finish.

The stains give rich, picturesque coloring effects that bring out the beauty of the grain of the wood, and the creosote penetrates the wood and preserves it. The stains are much more suitable for buildings of this type, because they color the wood transparently and retain all of its beauty, while paint would produce a uniform expressionless coating.

Besides being much more artistic than paint, and thoroughly preserving the wood, Cabot's Creosote Stains cost less than half as much as good paint, and can be put on at half the cost. The work can be done rapidly, and any intelligent laborer can do it, so that skilled labor is not essential. The colors are strong, rich and lasting. For the small house, therefore, these stains are vastly more appropriate than any other colors, and with their aid artistic and beautiful housing groups can be developed by the use of the cheapest materials. The money will go farther and the development will be more successful. For houses partly or wholly finished with stucco, Cabot's Waterproof Stucco Stains give similar results.

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This simple, homelike bungalow is more attractive than many costing twice as much, because the rough siding is capable of such rich and beautiful coloring with Cabot's Stains.

Unit of New Durham Development
A " Simpson-Craft " house, by John T. Simpson, Architect, of Newark. Stucco stained with Cabot's Stucco Stains, and trimmings with creosote stains. Stucco needs variety as much as any material.

Adv.